Fig 1

Fœtus papyraceus (compressus) The mummified fœtus is seen above attached to its own placenta

[Page 218

INTERNATIONAL CLINICS

A QUARTERLY

OF

ILLUSTRATED CLINICAL LECTURES AND
ESPECIALLY PREPARED ORIGINAL ARTICLES

ON

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BY LEADING MEMBERS OF THE MEDICAL PROFESSION
THROUGHOUT THE WORLD

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CONTENTS OF VOLUME I

(THIRTY-EIGHTH SERIES—1928)

DIAGNOSIS AND TREATMENT

MEDICINE

PÆDIATRICS

SURGERY

LIST OF ILLUSTRATIONS TO VOLUME I

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Diagnosis and Treatment

VISCEROPTOSIS

By JOHN PHILLIPS, M D

Cleveland Clinic, Cleveland, Ohio

Visceroptosis and splanchnoptosis are terms used to describe a prolapse or the descent of the abdominal viscera Although visceroptosis properly includes all the abdominal organs, all of them may not share in the downward descent, thus the position of the stomach may be lowered without any displacement of the kidneys, and the liver and spleen are rarely mal-placed. In speaking of the displacement of individual organs, specific terms may be employed, such as nephroptosis to signify the descent of the kidney, gastroptosis for the descent of the stomach, hepaptosis for descent of the liver, splenoptosis for descent of the spleen, coloptosis for descent of the colon, and enteroptosis for descent of the intestines

The condition which results from the generally lowered position of all the abdominal organs was first accurately described by Glénard, who in his admirable thesis on the subject discussed its etiology, pathology, and symptomatology For this reason the condition is frequently spoken of as Glénard's disease Glénard stated that in his opinion, no treatment had ever been devised that had been of much benefit and that patients with visceroptosis were destined to a life of more or less invalidism. Weir Mitchell, however, was one of the first to institute the successful treatment of this condition. In recent years our views about splanchnoptosis have been modified as the result of the radiological observations of Hurst, Alvarez, and many others, who have shown that the position of the abdominal viscera in normal individuals may vary considerably under certain conditions

Visceroptosis is not an infrequently encountered condition Glénard reported 148 cases among 1310 patients at Vichy, an incidence of 11 3 per cent , while in his experience Einhorn, whose practice is largely devoted to diseases of the gastro-intestinal tract,

has found ptoses of the abdominal viscera in 6 5 per cent among males and in 33 25 per cent among females The incidence of movable kidney is about 3 per cent among males and 20 per cent among females A slight degree of hepaptosis is not uncommon, but total hepaptosis is rarely seen Dutton Steele, in 1903, was able to find records of only one hundred cases of what he considered to be undoubted total hepaptosis, and more recent writers have questioned the validity of many of these older cases, because of the lack of adequate means of diagnosis, such as the rontgenological examination, etc. I have seen one case, which has been reported by Clarke and Dolley, in which total displacement of the liver was associated with gumma of that organ. Splenoptosis is of very rare occurrence I have seen one case in which the spleen, which was enlarged to twice its normal size, could be pushed down as far as the left iliac region

As for the etiology of splanchnoptosis, divergent views are held, some considering that the condition is always congenital, others that it is always acquired, while many take a middle ground Stiller, who was the first and strongest advocate of its congenital origin, emphasizes as evidences of an hereditary tendency, the slight build of these patients, the long narrow chest with acute costal angles and floating tenth ribs, the slender bones of the skeleton and the diminution of the panniculus adiposus Stiller described the condition as one of *asthenia congenita universalis* There may be, and undoubtedly is, an hereditary tendency to visceroptosis in a large proportion of the cases, yet undoubtedly there are many other factors which cause or increase the tendency to ptosis of the viscera Among such conditions may be mentioned (1) those which interfere with the proper development of the chest, such as adenoids or faulty habits of breathing, which cause the chest to be poorly expanded and the breathing to be mostly of the abdominal type, (2) conditions which interfere with muscular development in childhood—malnutrition, rickets, poor posture, and lack of exercise, (3) relaxation of the abdominal muscles from repeated pregnancies, (4) pressure on the lower part of the chest or upper abdomen from tight belts or corsets Keith has particularly emphasized the importance of a vicious method of respiration in the pathogenesis of visceroptosis He concludes that (*a*) the contractions of the crura of the diaphragm in particular are responsible for the displacement of the viscera in Glénard's disease,

(*b*) before the displacement can be produced, either the thoracic supports of the diaphragm must have yielded or the antagonistic abdominal muscles must have been hampered or weakened in their action, as, for example, by tight corsets or repeated pregnancies, (*c*) the bands which fix the viscera to the walls of the abdomen are of secondary importance

Many patients with visceroptosis complain of no symptoms whatever and are able to lead lives of normal activity If the condition is discovered in such cases, therefore, the physician should not overemphasize his findings Many patients date their first gastric or renal symptoms from the time at which a low stomach or a floating kidney was first discovered by an enthusiastic physician Nevertheless the recognition of the condition is important, because visceroptotic patients complain of many vague abdominal symptoms and thus are often subjected to unnecessary operations The surgeon removes the gall-bladder or appendix, the urologist performs a nephropexy, the gynæcologist suspends the uterus, and after each of these successive operations the patient's condition often becomes worse, until chronic invalidism is the result.

Among the general subjective symptoms of visceroptosis are headache, dizziness, a tendency to faint when standing, insomnia, exhaustion after slight effort, shortness of breath, and palpitation of the heart. Many patients complain of vague abdominal distress and of soreness, the latter often being relieved by an abdominal support Frequently there is nausea and vomiting, which in some cases of extreme gastroptosis is due to interference with the emptying of the stomach The bowels are often constipated In rare instances kinking of the bile-ducts in cases of hepaptosis or pressure from a floating kidney may produce jaundice In the presence of nephroptosis, in addition to a dragging pain in the back and sides, severe attacks of renal colic may result from kinking of the ureter (Dietl's crisis) In some patients psychoneurotic symptoms such as the various phobias, claustrophobia, agoraphobia, etc, are present I have been impressed with the frequent association of symptoms of neurocirculatory asthenia with visceroptosis

On examination, the physician is impressed with the characteristic habitus, the small bones, the slender curved "ewe neck," the long flat chest with acute costal angles and floating tenth rib, the

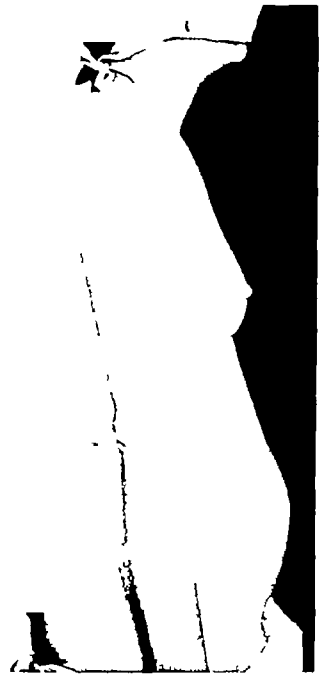
relaxation of the abdominal muscles with a diminution of the panniculus adiposus, the prominence of the lower part of the abdomen, and in some cases the peculiar facies, which indicates the presence of adenoids (Figs 1 and 2*A*)

The characteristic configuration of the body—the prominent scapulæ and the lumbar lordosis—can be observed only when the patient is standing The hands and feet are long and thin, the skin is moist and clammy, cyanosis of the extremities is often present, the arches of the feet are often weak X-ray examination of the spine and of the gastro-intestinal tract is of special value in the identification of the misplaced organs and the associated deformities

Two types of treatment may be considered (*a*) Preventive treatment and (*b*) corrective treatment after the condition is once established

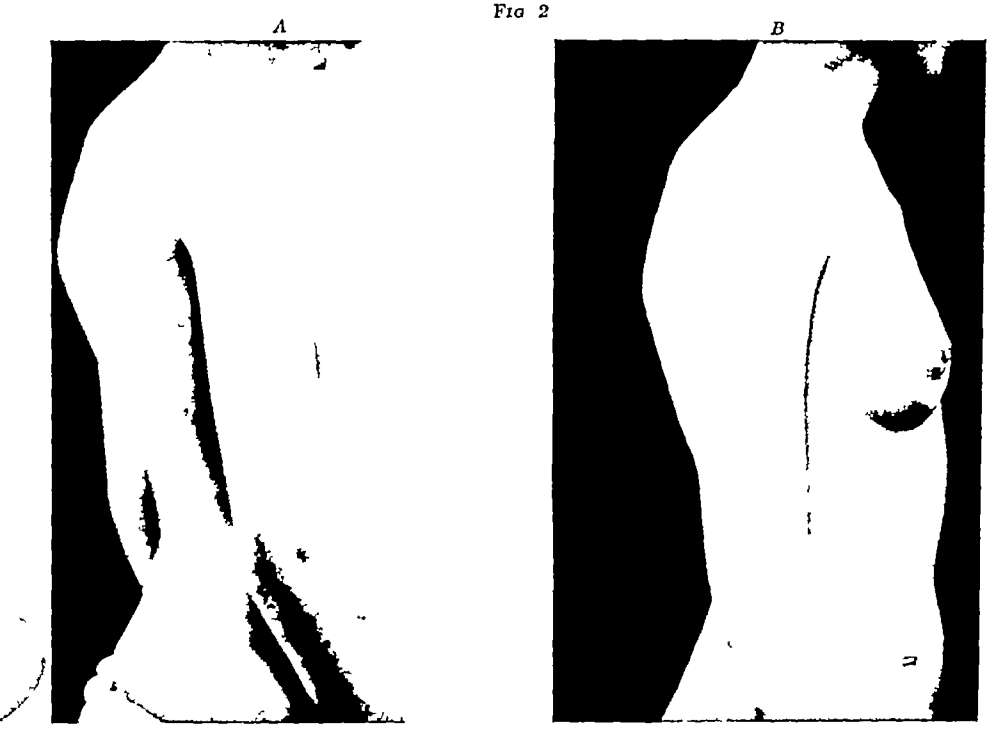
Preventive treatment should be begun in childhood In children with an asthenic habitus, every effort should be made to maintain the best possible physical condition. I believe that the prevention of rickets is an important factor in the avoidance of visceroptosis because of the weakening effect of this disease on the skeletal muscles Rickets can be prevented by proper feeding, by the continuous administration of cod-liver oil during the first two years of life and by sufficient exposure of the child's body to the direct rays of the sun If breathing is obstructed by adenoids, they should be removed in order to prevent the development of a pigeon breast and narrowing of the lower thoracic zone Older children in whom the characteristic visceroptotic bodily form is present or displacement of the abdominal organs is beginning should be required to lie down for one or more periods each day, especially after meals, should be encouraged to eat liberally in order to keep the weight near the calculated ideal figure and should be given breathing and postural exercises which are designed to enlarge the circumference of the lower thoracic zone and to strengthen the abdominal muscles (Figs 2*B*, 3 and 4) Tight belts should not be worn During convalescence from a prolonged and wasting illness, the patient should be massaged in order that the skeletal and abdominal muscles may be strengthened before the patient begins to get out of bed During the puerperium the following prophylactic measures advised by Fairburn for strengthening the muscles of the abdominal wall and pelvic floor are

FIG 1



Photograph illustrating the type of posture in a case of visceroptosis

FIG 2



Photographs illustrating the posture in a case of visceroptosis Some improvement is manifested in *B* as compared with the posture in *A* which was made before the treatment was started

Fig 3

A

B

Photographs (A and B) illustrating the correction of visceroptosis and improvement in posture which may be gained through proper exercise

Fig 4

Photographs (A and B) illustrating the improvement in posture brought about by proper exercise in the case of a young girl

very beneficial (1) Early in the puerperium the patient is allowed to rise to empty the bladder and to move the bowels (2) Massage may be given, to be followed by physical exercises in bed (bed gymnastics), such as breathing exercises and exercises for the abdominal muscles The muscles of the pelvic floor may be exercised by contracting the levator ani with resisting movements of the adductors of the thigh, as if to hold a bowel movement (3) For two days, before getting out of bed, the patient should exercise for at least ten minutes morning and evening while sitting on the edge of the bed—bending the body and moving the heels and toes, thus gradually accustoming herself to bear the weight of the body on the lower extremities

After parturition or after the removal of large quantities of fluid from the abdomen, a properly fitting abdominal support should be worn.

A large proportion of the patients with visceroptosis are underweight For such patients a highly nutritious diet should be prescribed in order that the caloric needs of the body may be amply supplied These patients should avoid foods that are apt to produce flatulence or indigestion. In general, the daily intake of food should yield from 40 to 45 calories per kilogram of body-weight When the patient is nervous and underweight, a modified Weir Mitchell regimen of rest, isolation and forced feeding for a period of from four to six weeks is advisable The successful treatment of the visceroptotic patient with psychoneurosis demands optimism on the part of the physician, together with careful attention to details and a sympathetic understanding The same attributes combined with infinite patience and strict adherence to orders are necessary in the nurse, in order that the patient may be kept in a happy and hopeful frame of mind and may be persuaded to partake of a sufficient quantity of food The following diet together with a glass of half milk and half cream with the meals or between meals and at bedtime is usually well tolerated by most patients

DIET LIST

Soups Broths or creamed soups which are not rich in spices, condiments or meat extracts

Meats Lamb or mutton (broiled or roasted), bacon, rare roast beef or rare beefsteak

Poultry Chicken, turkey, or squab (boiled, broiled or roasted)

Eggs Soft-boiled or poached.

Fish Blue pike, white fish, bass, haddock, halibut, trout, fresh mackerel or perch
Vegetables White potatoes (mashed, boiled or baked), peas, string beans, asparagus, lettuce, spinach, cauliflower, squash, carrots, celery, beets or tomato juice
Cereals Cream of wheat, farina, oatmeal, shredded wheat, grape nuts, corn flakes, puffed rice or wheat.
Fruits Oranges, very ripe bananas, grapefruit, grapes, berries, cooked pears, peaches, prunes, apples, melons
Cheese Cream or cottage
Bread White, whole wheat, bran, or graham bread, simple wafers or crackers (Hot breads should not be eaten)
Desserts Rice, cornstarch or tapioca pudding, cup custard, gelatin, vanilla ice cream, simple cake
Beverages Milk, cream or buttermilk, moderate amounts of cocoa, weak tea or coffee
Salads Simple salads with oil

ARTICLES OF DIET TO BE STRICTLY AVOIDED UNLESS OTHERWISE ADVISED BY PHYSICIAN

Rich soups
Pork (except bacon)
Corned or potted meats
Hash or twice-cooked meats
Stews
Sausage
Kidneys or liver
Goose or duck
Smoked, preserved or salted fish
Canned salmon or sardines
Lobster or crabs
Sweet potatoes
Radishes
Cabbage
Corn
Turnips
Cucumbers
Candies and milk chocolate
Pies and pastry
Hot breads or cakes
Syrups
Preserves
Nuts
Strong coffee or tea
All fried foods
Alcoholic beverages

It should be borne in mind that the diet should be varied to suit the individual taste of the patient However, the patient should be instructed that any article of diet not included in the list presented by his physician should not be eaten without his consent. Considerable quantities of water should be taken between meals and on rising in the morning, while but little should be taken with the meals If the stomach empties slowly after meals, the patient should lie on his right side with the hips slightly elevated

In cases in which visceroptosis is associated with psychoneurosis, occupational therapy and hydrotherapy play a very important part in the treatment Occupational therapy may take the form of weaving, basket making, metal working or whatever type of hand-

work may interest the patient When the hands of the patient are well occupied the mind cannot dwell on the bodily ailments Hydrotherapy in the form of warm baths, of spinal douches or of applications of the drip sheet may be useful to promote sleep and relieve restlessness

The administration of drugs plays but a small part in the treatment of visceroptosis For constipation, besides regulation of the diet, exercise and massage, mild laxatives such as liquid petrolatum, agar, psyllium seeds, phenolphthalein, senna or cascara may be used occasionally A morning saline laxative is very beneficial In order to be certain of a thorough evacuation of the bowels, an occasional enema may be given If the patient presents symptoms of hyperacidity of the gastric secretion, an alkaline powder of bicarbonate of soda and calcined magnesia should be given If gastric analysis shows hypoacidity of the gastric secretion, dilute hydrochloric acid, which may be combined with a bitter stomachic such as tincture of nux vomica, should be given with the meals If anæmia is present, iron and arsenic should be given either by mouth or hypodermically The best general tonics are cacodylate of soda, which is given hypodermically, or strychnine in increasing doses For patients who are extremely nervous, relief may follow the administration of sodium bromide combined with tincture of hyoscyamus or of small doses of phenobarbital However, too much reliance should not be placed on nerve sedatives, as rest and sleep can be assured by isolation and hydrotherapeutic measures

Postural exercises are of great importance in the treatment of visceroptosis, as by their use the abdominal muscles are strengthened, correct methods of breathing may be developed, the circumference of the lower portion of the thorax is increased and lordosis may be overcome In every case of visceroptosis it will be noted that the lower ribs have dropped, the abdominal wall has advanced—as can be well seen during inspiration, and there is a lordosis of the lumbar spine The object of the postural exercises is to overcome these defects by increasing the area of the lower part of the thorax so as to supply ample space into which the abdominal viscera may ascend As improperly executed movements are useless, it is important that the patients be properly instructed in the correct method of taking the exercises and that they be reviewed with the patient at regular

intervals A careful explanation of what it is hoped the exercises will accomplish will give new hope to the patient Enthusiasm on the part of the physician will beget enthusiasm in the patient If the latter can look forward with hope to the future, he is on the broad road to recovery At first the exercises should occupy about forty minutes daily, but later on this may be reduced to fifteen minutes

The following exercises are recommended by MacMahon, who advises that each one be performed eighteen times, with a brief period of rest after each six movements

(1) The operator places his hands on the patient's sides, over the lower ribs and level with the bottom of the sternum The patient breathes in through the nose so that the lower ribs are felt to be expanding strongly, with as little movement of the upper chest as possible When by inspiration the fullest inferior lateral costal expansion is acquired, the patient breathes out through the open mouth until the ribs are felt to regain their normal position.

(2) The patient breathes in by three distinct movements, without expiration between them, and with each inspiration the lower ribs should be felt to expand By degrees these separate inspiratory movements are increased to five.

(3) The abdominal wall is contracted inwards and then allowed to recover its normal position, so as to make an in-and-out movement The operator aids the contraction by pressure on the lower part of the abdomen This is a physical and not a breathing exercise Fifty contractions in all should be made, in groups of ten each

(4) The fourth exercise is the same as No 3 except that each contraction is made in three instead of but one movement. On each contraction, the operator presses upwards so as to increase the amount of pressure.

(5) Exercises (1) and (3) are combined, that is, the patient breathes in through the nose and strongly expands the lower ribs The mouth is then opened and the abdominal muscles are slowly and strongly contracted, so that the air is driven from the lungs

(6) The patient inspires as in (1), but the breath is held and the abdominal muscles contracted in from three to five separate movements before breathing out, while the chest is held in the expanded position, the legs may be raised and lowered from three to four times alternately

(7) The patient breathes in deeply with two or more inspiratory movements, and during the inspiration two contractions of the abdominal muscles are made This exercise is somewhat severe and should be repeated only six times.

While taking the above exercises, the patient should lie on a firm couch with the back straightened, so that the lumbar spine rests on the couch. When the patient is standing or walking the body should lean a little forward from the hips and the shoulders should be pressed back. The patient may be given the idea of the correct posture by being made to stand with the back pressed against a wall, while the chest is held in the expanded position

The exercises recommended by the physiotherapy department of the Cleveland Clinic are illustrated in the accompanying cuts and are described as follows

Exercise I—Chest breathing Position Lying on back, knees bent, elbows on table Chest raised and held high while breathing deeply Mouth closed when inhaling, open when exhaling

Exercise Inhale and relax upper abdominal muscles, exhale by contracting abdominal muscles

Explanation Since the diaphragm and the anterior abdominal walls should coordinate their action through the respiratory centre, the contraction of the diaphragm and relaxation of the upper anterior abdominal muscles should occur together, the abdominal wall being pushed outward by the pressure of the diaphragm transmitted through the abdomen. At expiration, by contraction of the upper abdominal muscles the intra-abdominal pressure is transmitted to the diaphragm, stimulating it to relax.

Exercise II—Retraction of abdomen Position Lying on back as in Exercise I

Exercise Flatten the lumbar spine against the floor or table by contracting the abdominal muscles Do not put weight on feet

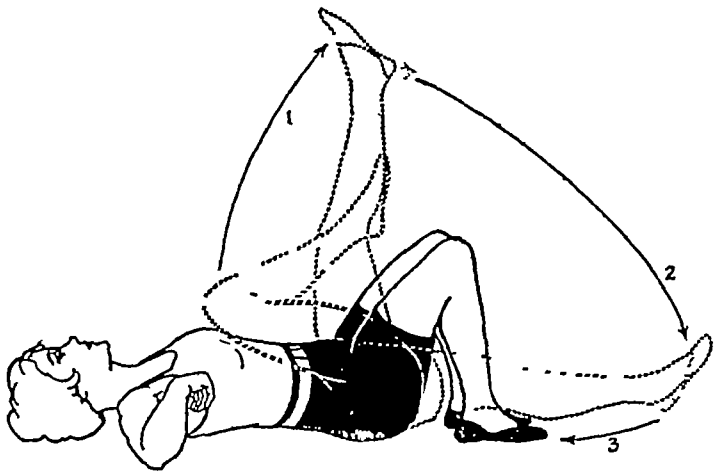
Explanation To flatten the lumbar spine the inclination of the pelvis must be diminished By contracting the abdominal muscles, thus straightening the lumbar curve against the table, the whole pelvis rolls, so that the end of the spine (the coccyx) is raised slightly from the table (The pelvis rotates through the hip-joint.) This is an excellent abdominal exercise. It develops the ability to

diminish the pelvic inclination and aids the patient in carrying out a similar exercise while standing

Exercise III—Position As in Exercise I.

Exercise Bend right knee toward chest, straighten leg upward,

Fig 5

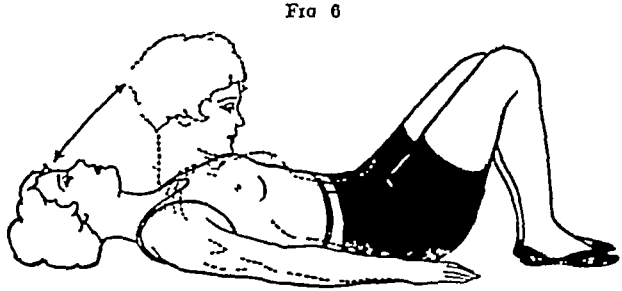


Exercise III

lower slowly, keeping the knee straight and the back flat against the table Repeat with left leg (Fig 5)

Explanation The abdominal muscles are brought into play, not only by the leg action, but also in the attempt to hold the pelvis in position. This is an excellent abdominal exercise

Fig 6



Exercise V

Exercise IV—Position as in Exercise I, except that the right knee is straight

Exercise Raise the right leg, lower it slowly, keeping the back flat. Repeat with the left leg

Explanation This exercise brings all the abdominal muscles into play.

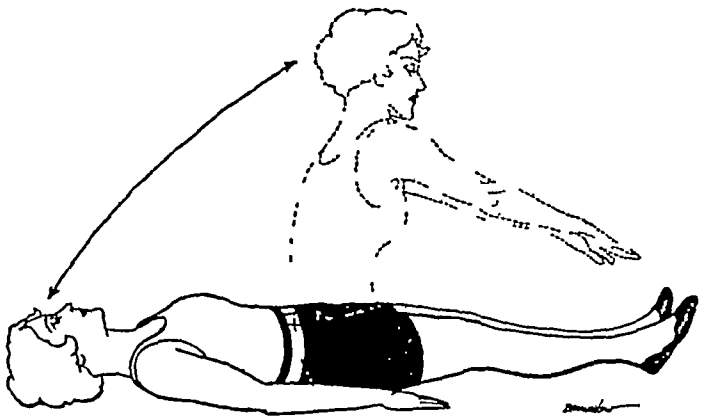
Exercise V—Position As in Exercise I

Exercise Raise head and shoulders upward and forward, lower to original position. (Fig 6.)

Explanation This exercise brings the upper abdominal muscles into play

Exercise VI—Position Lying in the supine position, pelvis tilted, knees straight, arms above head

Fig 7



Exercise VI

Exercise Rise to sitting position with back held straight, arms reaching forward to toes Lower the body slowly (Fig 7)

Explanation This exercise brings all the abdominal muscles into play

Exercise VII—Rib-stretching exercise Position Lying on back, hands at sides

Exercise Raise one shoulder, elevating ribs and stretching intercostal muscles on the same side, repeat with opposite shoulder, then raise both shoulders, elevating ribs on both sides as much as possible

Explanation Stretching the ribs helps to gain flexibility in the dorsal spine, which is necessary before progress can be made in standing exercises Spreading the lower ribs increases the intercostal angle, which is important in lessening the inclination of the ribs while standing

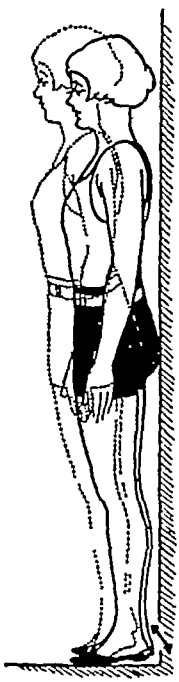
Exercise VIII—Position Standing, hands behind neck.

Exercise Raise one shoulder, elevating ribs on the same side, repeat with opposite shoulder, then with both, simultaneously

EXERCISES FOR CORRECT POSTURE WHILE STANDING

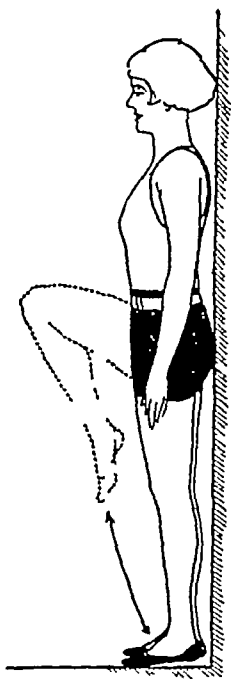
Exercise IX—Position Standing with heels four inches from wall, hips, shoulders, head touching wall, hands at sides

Fig 8



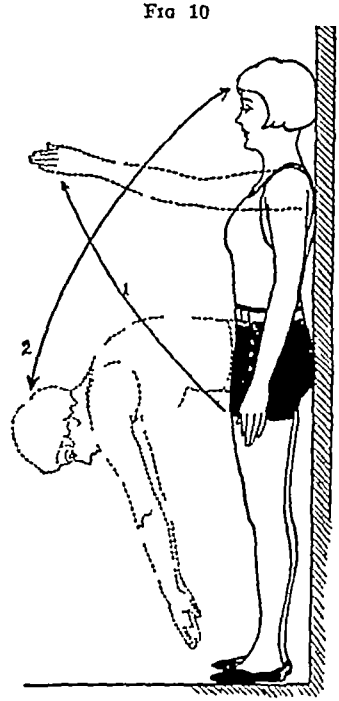
Exercise X.

Fig 9



Exercise XII

Fig 10



Exercise XIII.

Exercise Keeping buttocks against wall, straighten lumbar curve against wall by contracting abdominal and gluteal muscles

Explanation The strong contraction of the abdominal and gluteal muscles tends to draw the buttocks down and the coccyx slightly forward The iliopsoas muscles are contracted, thus holding the pelvis in this position.

Exercise X—Position The same as in Exercise I

Exercise Keeping the body in the same posture, step forward, and raise and lower the body on the toes (Fig 8)

Explanation· This exercise is designed to accustom the patient to maintaining the correct position while standing and walking

Exercise XI—Position The same as in Exercise I

Exercise Keeping the body in the same posture, walk forward and then backward to the wall

Explanation By holding the pelvis at the correct inclination the lumbar curve is kept normal With the chest raised forward and upward, the lower spine is relieved of the strain of carrying the superimposed body segments This is a most important corrective exercise

Exercise XII—Position The same as in Exercise I

Exercise Bend right knee, raise toward chest, lower slowly Repeat using left knee (Fig 9)

Explanation This exercise brings into use additional muscles, and helps to push the lumbar spine into position.

Exercise XIII—Position The same as in Exercise I except that the arms are held forward.

Exercise With body relaxed, bend forward, with knees held straight and if possible touch the floor with the hands Then return slowly to upright position, tilting the pelvis until the back is again flat against the wall. (Fig 10)

Whether or not abdominal supports or belts should be worn depends upon the conditions in the individual case In order to ascertain whether a belt will give relief, the so-called "belt sign" of Glénard should be tested To do this the physician passes his arms round the patient from behind, placing his hands on the abdominal wall below the umbilicus If the patient experiences relief when upward pressure is made and experiences discomfort when the pressure is released, an abdominal support will be of benefit But if discomfort results from the upward pressure and the patient is relieved when the pressure is released, no benefit will be derived from a support Glénard called this phenomenon "epreuve de la sangle" Various types of abdominal supports have been devised The simplest is adhesive plaster applied according to a method modified from that of Rose and Rosewater (Fig 11)

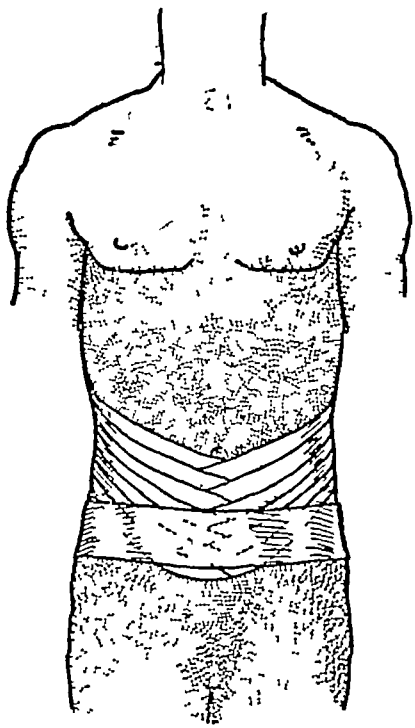
I have used this method frequently in out-patient practice, with great relief to the patients Various belts have been designed, that of Aaron serving the purpose as well as any

A properly fitting corset which gives good support to the back and at the same time exerts upward pressure on the lower abdomen is preferable to a belt. (Figs 12 and 13) It should be remembered,

however, that the purpose of belts and corsets should simply be to supply a temporary aid, as the most important aim of treatment should be to strengthen and to improve the tone of the abdominal muscles by increasing the expansion of the lower part of the chest and improving the posture

Surgery may be definitely indicated in cases of nephroptosis with Dietl's crisis, or of gastroptosis in which the emptying of the stomach

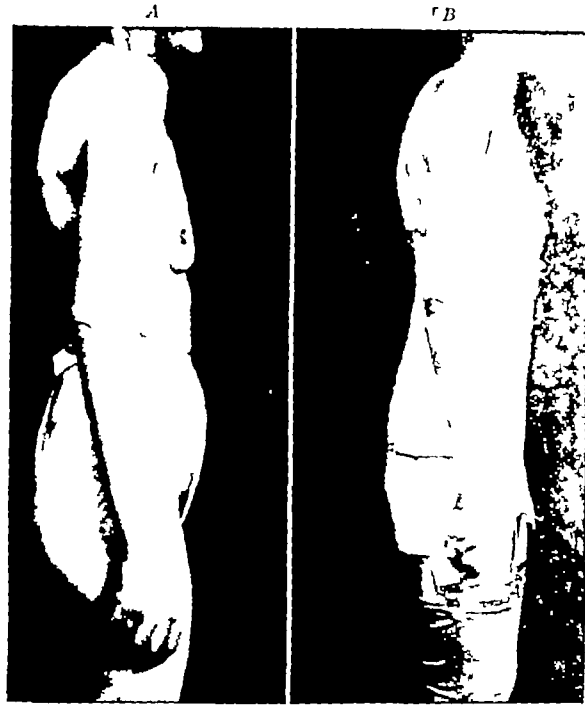
Fig 11



Drawing illustrating the method of applying adhesive bandage in a case of visceroptosis. Redrawn after Rose.

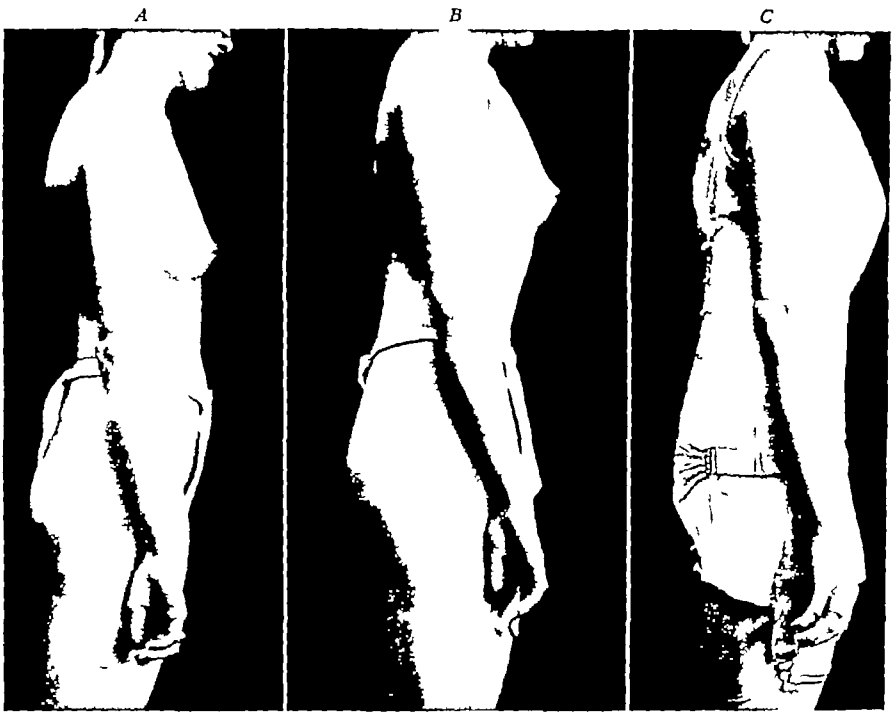
is interfered with to such degree that it cannot be relieved by regulation of the diet or by lying on the right side with the hips elevated after a meal In cases in the latter group it may be necessary to do a gastro-enterostomy or one of the various operations which have been devised for the relief of gastroptosis, such as Beyea's operation, in which the stomach is suspended by shortening the lesser omentum, or the operation devised by Coffey in which the stomach is suspended in a hammock of the great omentum, or Rovsing and Duret's opera-

FIG 12



Photographs (A and B) illustrating the improvement in posture in visceroptosis by wearing a well fitting corset

FIG 13



Photographs (A B and C) illustrating the improvement in posture which may be brought about by correct exercise and further improvement resulting from the wearing of a well fitting corset

tion in which the stomach is directly sutured to the anterior abdominal wall A careful study of each patient should be made, on the one hand, that surgical measures may not be neglected if they are indicated, and on the other, that unnecessary surgical operations may not be performed

In conclusion, I should like to make an earnest plea for a careful diagnostic study and treatment of this large group of patients with visceroptosis, who live in a greater or less degree of chronic invalidism and for whom partial or complete relief may often result from painstaking study of the needs of the individual case, and from careful re-education of the patient as to habits of life, especially as regards diet and exercise.

A QUARTER OF A CENTURY OF LIGHT TREATMENT AT THE LONDON HOSPITAL

By W J O'DONOVAN, M D

Physician to the Skin Department of the London Hospital, London, England

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THE leading characteristic of the skin disease called lupus is destruction of tissue This tuberculous condition of the skin in the old London bills of mortality was then termed "Lupus, the Wolf," its name representing destruction in an acute and aggravated manner

Deformity resulting from this disease is often most distressing, the infiltration may creep from cheek to cheek, destroying the nose in its passage, and may produce so great a contraction that the eyelids may be drawn down upon the face and the shortened upper lip may permanently expose the gums of the upper jaw.

It is a disease due most probably to over-crowding, and to a tubercle-infected milk and food supply

From its foundation in 1740 cases of lupus have been received at the London Hospital and treated according to the highest standards in vogue at any time under consideration.

Our predecessors, mighty men in their day, fought lupus gallantly, but in a manner the recital of which is excruciating to modern ears Arsenical pastes and powders were rubbed into open sores, fuming nitric acid was applied to lupus patches while the patient's screams resounded through the building

In England the greatest and most beneficent advance from those days is due solely to the intervention of our Royal House It was Queen Alexandra, our President, who first presented to the London Hospital, in 1899, one of Finsen's lamps that were then making his name and work famous throughout the dermatological world

About this time the London Hospital House Committee felt that if skin cases were to hold their own in the line of progress in competition with the rapidly advanced drama of modern surgery, such cases must be grouped together The first physician appointed at the London Hospital to have sole charge of such patients was Dr J H. Sequeira, appointed on September 3, 1902 One of his earliest

duties was to go to, and stay in, Copenhagen to study personally the technic of this new light therapy. Had he misjudged the value of this treatment, its introduction into England would have been delayed for many years Had he not persevered against discouragement, the treatment might have fallen into desuetude, but the Queen's motto painted across the Light Department is "Nothing like perseverance"

In the early days, zealous and persevering attempts were made to achieve local light therapy by focussing the sun's light by lenses onto the diseased areas Sunshine is, however, variable, and our weather is capricious, although results were achieved, nevertheless in a busy hospital no department could be organized in which the workers would never know how many hours a day they would be able to work, and the patients would never know whether or not to attend

The artificial sunlight provided by Finsen's lamps and focussed by quartz lenses through telescope tubes was England's answer to its proud and fickle mistress, the weather

Year after year for twenty-seven years lupus has been fought by a succession of devoted sisters and hard working nurses, and one must also say, by faithful cooperating patients Lupus is a disease made up on confluent innumerable nodes, or tubercles in the skin, and these, one after the other, must be patiently picked out and treated by a pencil of powerful light.

In extensive cases patients have attended daily for three to four years, and when cured would go forth into the highways and byways and gather together others, often worse than themselves, and send them up to the Light Department of the London Hospital for cure Each patient during the time of treatment had of necessity to have the undivided attention of a nurse, whose duty it was to keep the diseased area in focus with the lamp and under pressure for an hour at a time

The expense of such a heavily staffed department must always have weighed upon the minds of the responsible authorities, but in lean years or fat years, no attempt was ever made by the committee to foreclose upon the monies spent on the healing of lupus

More than the patients perhaps, the doctors in charge of the department and its work have always realized how much they

depended upon lay help and lay cooperation for the achievement of their ends Firstly, the patients from afield must be lodged, a mutilated, deformed, diseased face is not welcome at every table, nor at every lodging The Samaritan Society of the hospital gradually accumulated a list of kindly souls of the working class, who, at very little profit, accept these patients as boarders for years at a time The same society finds clothes and fares, and even pays the lodging of such cases for many months on end The clergy in villages up and down England have often, at great sacrifice, maintained patients afflicted with lupus that they might live in the vicinity of the hospital and be cured of the affliction Over these years the sisters have been unwearied in their efforts not only to treat patients, and to dress their ulcers, but have been equally unwearied in encouraging their patients to attend, in overcoming their weariness, their homesickness, and often their fickleness The more enterprising of the patients have often sold up house and home to live near the hospital to achieve a cure It can never be said that the Public Health authorities have been remiss in their care of lupus, Boards of Guardians, Tuberculosis Officers, and Medical Officers of Health would all help whenever within their statutory powers a case came under their particular care They used their health visitors to encourage the patients' attendance, they often provided season tickets, they lodged country cases in London infirmaries, and the London County Council, ever in the front of public enterprise, has established a lupus school near the London Hospital, so that these children's education and training can be carried out together with the cure of their disease

The installation of universal light baths was begun experimentally in 1922, and has added to the labors of the hospital and the burden of its House Committee

Originally a small carbon arc lamp was fitted to an upright, and six boys were exposed daily at first for half an hour, and later longer, to the unshielded light. These were all patients whose tubercular skin lesions were not responding satisfactorily to treatment, and the beneficial change that began to show became the subject of comment among the all-too-many cases of severe lupus attending the Light Department. The poor women patients, anxious to share in this treatment, subscribed amongst themselves the sum

of £1500 towards the cost of erecting an adequate light bath department, and to record this, Lord Knutsford has erected a memorial tablet on the wall of the new department opened in January, 1925, in the London Hospital

The results of this new therapy have been published in the scientific journals, and have received adequate recognition and imitation

It was soon noted that the benefit of this new treatment could not be confined to tubercular diseases of the skin. Trial was made upon many chronic maladies, and the results that are being achieved daily from this new attack are leading to the establishment of light departments in every hospital, whether voluntarily or rate supported, in the United Kingdom.

This new light treatment does not imply that any old and tried method, whether surgical or medical, is to be scrapped, but implies that a new weapon is given to the medical profession This weapon is expensive, powerful, potent, and dangerous Patients have undoubtedly been killed by light therapy, as they have been killed by surgical procedures, hence every effort must be made to discourage its use by quacks, or its employment in cases where specialists have found it to be unsuitable

The great safeguard of the public lies in the fact that the work done with "light" in the voluntary hospitals is open to the inspection of all visiting doctors, and to the criticism of the experienced members of its House Committee, its students, and its nursing staff In this working army of medicine nothing unsound, nothing pretentious, can long survive

It is said that he who adds to knowledge, adds to sorrow, and it is certainly true that every advance in medicine, such as light treatment has undoubtedly been, has placed a new burden on the back of the administrators, the committees, and the subscribers to our great public charities

DEPARTMENT OF DERMATOLOGY

Physician to the Skin Department of the hospital, W J O'Donovan, O B E, M D, Lond, M.R C P, Lond, First Assistant, J T Ingram, M D, Lond, M R.C P, Lond

IN-PATIENTS

Doctor O'Donovan visits the wards on Thursdays to examine the cases under his care He is attended at his visit by the First Assistant, the House Physician, and the Clinical Assistants to the department, and gives bedside instructions to students

OUT-PATIENTS

Doctor O'Donovan attends in the Out-patients' Department on Tuesday and Thursday mornings at 9 o'clock to examine patients He gives oral instructions to students in the diagnosis and treatment of diseases of the skin.

The number of new patients attending this department averages about 6000 a year.

LIGHT DEPARTMENT

In connection with the Department for Diseases of the Skin, there is a large department for the treatment of lupus and other skin diseases by means of light rays according to Finsen's method by arc light radiation and by means of the Rontgen-rays and radium Since 1922 a large new floor has been added for general light bath therapy

The department is open daily from 9 A.M. and instructions given in method of treatment There is also an installation of medicated baths for the treatment of skin diseases

The large venereal clinic attached to the department affords every facility for the study of modern methods in the diagnosis and treatment of syphilis Special instruction is given to the students in the technic of intravenous treatment

LECTURES

Doctor O'Donovan will give a course of lectures on the diagnosis and treatment of skin diseases during the winter and summer sessions on Thursdays at 11 A.M

The lectures in January, February and March are on syphilography

Doctor Ingram will give a course of practical instruction in the histology of cutaneous diseases at times to be announced

A CASE OF VERTEBRA PLANA (CALVÉ)*

By H J PANNER, M D

Chief of the Röntgen Department of the Rigshospital, Copenhagen, Denmark

A LITTLE more than two years ago, Calvé was the first to call attention to an affection of the vertebral column—of which he describes two cases—which he compares with Calvé-Perthes' hip disease and Koehler's disease of the navicular bone, and recently the Dutch scientist, Harrenstein, has communicated two other, similar cases, but otherwise that affection does not appear to have been mentioned anywhere, and must, thus, be accounted as among the rare occurrences

It may, therefore, be of interest to bring forward and discuss at some detail a case of that same affection, which I believe to have been observed, especially as the history of this case is peculiar in several points, among others in the fact that the patient has been observed eight years after the affection first declared itself

The case is that of a man who is now twenty two years old and a farmer On September 5, 1919—when he was *fourteen years old—he was admitted into* the Department D of the Rigshospital (Professor Schaldemose) under the diagnosis, spondylitis tuberculosa. From the journal of the department at that time it is seen that "one of his brothers is stated to be suffering from 'glands', otherwise the family is in good health"

The patient, too, had formerly been in good health and, especially, had not shown any symptoms either of scrofula or of lung troubles A year before being admitted into the hospital he began, little by little, to suffer from a steadily increasing weakness of the back, which, after a couple of months, incapacitated him for any work or occupation He had difficulty in keeping himself upright when walking, and had to use a stick Later, he got pains in the chest, and in the part of the back corresponding to the lower dorsal vertebræ, and some months before he was admitted to the hospital a slight gibbus began to develop at a level with the point of the back where the pains were felt. The attacks were varying in strength. On the whole they were not very intense, still, at times enough to make him keep to his bed, and, at any rate, he was unable to work There was no weakness of the lower extremities, and absolutely no other signs pointing to a compression of the medulla. Altogether, there were no pathological symptoms whatever, except the ones just described

At the time of his admission the patient looked healthy, robust and in a

* A communication made at the Fifth Meeting of the Northern Association for Medical Radiology, Copenhagen, July 1, 1927

fairly well-nourished condition Investigation of the organs showed nothing abnormal

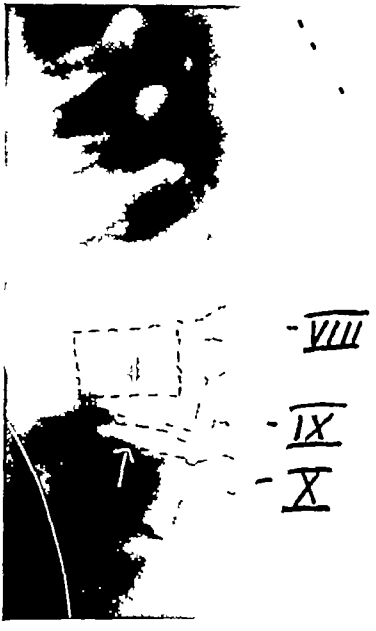
A careful study of the vertebral column showed a *slight* arcuate kyphosis, with prominence corresponding to the eighth and ninth thoracic vertebræ, no scoliosis, and no tenderness either direct or indirect There was a slightly increased lordosis of the lumbar region. He could rise from a recumbent position without using his hands, and had no difficulty in bending to pick up things from the floor After being kept in bed for a short period he felt perfectly well, after a couple of weeks he was allowed to be out of bed again, found no return of the pains from being up and moving about, and was discharged in good health, on October 10, 1919 There had been no rises in his temperature during his stay in the hospital

Röntgen examination of the spinal column, on September 6, 1919, showed—as seen in Fig 1—nothing abnormal except as regards the ninth thoracic vertebra, the body of which, in the lateral view, is only represented by a very narrow shadow, a couple of millimetres high, with a slight, wavy irregularity of demarcation upwards and downwards This shadow is, if anything, rather more intense than the shadows of the vertebræ immediately above and below The bodies of the eighth and tenth thoracic vertebræ show a perfectly natural, respectively upper and lower, outline; and each of them forms the limit of a somewhat wedge shaped intervertebral space, narrower anteriorly than posteriorly owing to the existence of a gibbosity, which is due to the fact that the anterior margins of the eighth and tenth vertebræ have approached one another The interval between the posterior margins of those two vertebræ is about twice as wide as the one between their anterior margins, but there nevertheless remains a distinct space, also anteriorly, between the pathologically altered vertebra and either of its neighbors Posteriorly, the intervertebral spaces between the ninth vertebra and its neighbors are of more or less normal height. The ninth vertebra, with its small vertical diameter, is seen very distinctly also in the antero posterior view (Fig 2), but otherwise the pathological features stand out best in the side view There is no scoliosis, and no shadows of any gravitation abscess

We were rather at sea as to the exact nature of the affection I have described here We did not think it could be the case of any tuberculous process—a supposition spoken against, moreover, by the whole clinical picture with its very light symptoms We thought that possibly it might be a case of some congenital anormality

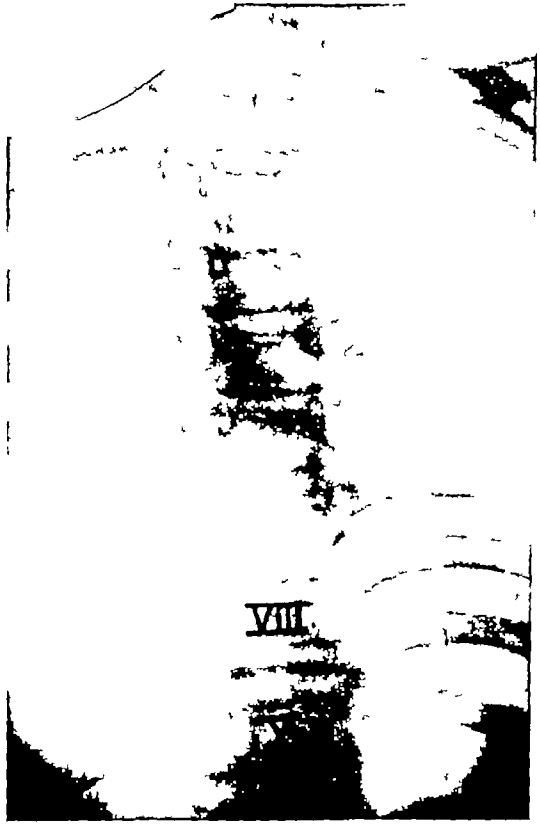
The picture of that Rontgen observation stayed in my mind, however, and when I read that article of Calvé's, to which I referred in the beginning, I was struck by the similarity between the Rontgen pictures of his cases and those of my own, so I decided to look up our patient and inquire as to the course his affection has taken in the intervening years

Fig 1



Skiagraph of patient (side view) on September 6 1919 (See page 22 for explanation)

Fig 2



Skiagraph of patient (antero-posterior view) on September 6 1919 (See page 22 for explanation)

Fig 3

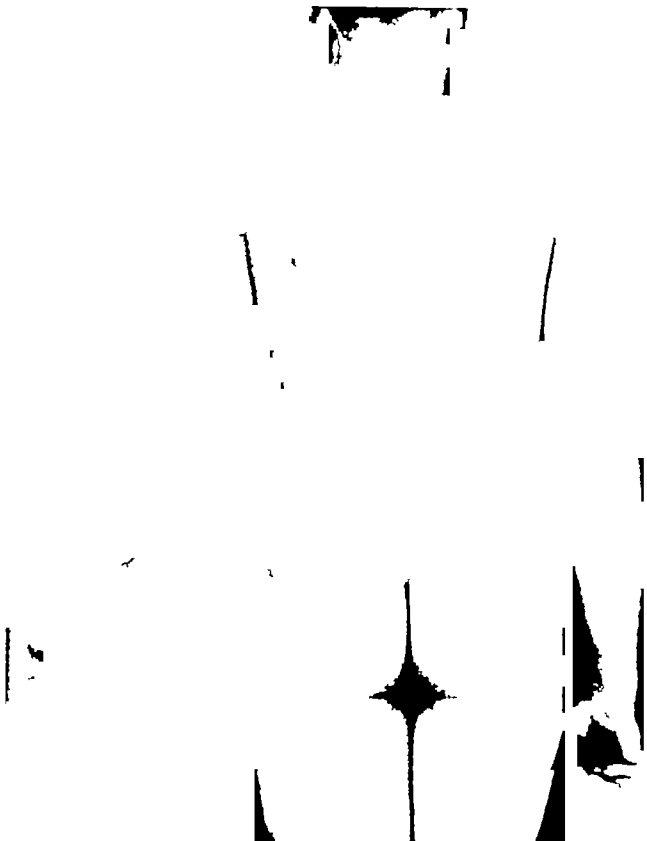
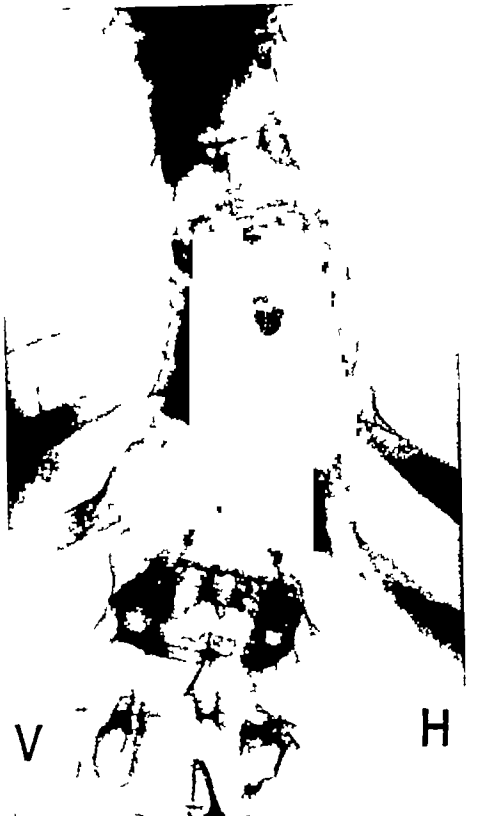


Fig 4

Fig 5.

Skiagraph of patient (lateral view) (See page 23 for explanation)

Fig 6



Skiagraph of patient (antero-posterior view)
(See page 23 for explanation.)

I found that during the first four years he had been so well that he had worked as a farm hand in the country without feeling any inconvenience except for a slight pain in the back now and then, but that, beginning with the fall of 1923, the pains had gradually become more intense, until they finally became so strong that, on May 1, 1924, he had to be admitted into the State Hospital at Sonderborg (Chief Surgeon Dr J Ipsen), where his case was taken to be one of a spondylitis not entirely subsided At first he was put in a plaster jacket, but his condition soon improved, and the plaster jacket was, therefore, exchanged for a leather corset, which he has worn ever since His condition has remained more or less unchanged He has frequently, for certain short periods, had more or less pains in his back, but has nevertheless in the mean time been able to perform most of his work, though he cannot get along without his corset. Apart from the trouble with his back, he feels perfectly well, and an objective examination discloses no abnormality beyond that trouble His looks are healthy, and his musculature is strongly developed (Figs 3 and 4)

As it will be seen from the pictures, there is a slight kyphosis, corresponding to the eighth, ninth and tenth thoracic vertebræ There is no tenderness, either direct or indirect, corresponding to that region, but while the rest of the column is freely movable, that part of it is held rigid when the patient moves his back He can bend over and pick up things from the floor without support, but if he has to remain in the bent position for any length of time he is obliged to use his hands and take hold somewhere, as, otherwise, he gets pains in the region of the gibbus There are no signs of any gravitation abscess

Pirquet's test gave, on the second to third day, a barely visible redness around the scratches, that is to say, a rather negative reaction

Röntgen examination disclosed a condition strongly reminding of what had been observed on the previous occasion. In the lateral view (Fig 5) the body of the ninth vertebra is still seen as a very flat disc—a little irregular in form and uneven in shadow—without any distinct appearance of osseous structure. The gibbus is now more strongly pronounced than formerly, the bodies of the eighth and tenth vertebræ touching one another with their anterior margins, and here a small triangular shadow is seen, slightly in front of the anterior surface of the column, in prolongation of—but separated from—the ninth vertebra. The intervertebral spaces between the three vertebræ are a little smaller than before, smallest in the anterior direction, but there is absolutely no sign of any destructive process While the body of the ninth vertebra, thus, appears as very small, its arch and posterior portion do not seem to present any abnormal features Altogether, it is not easy to make out the details plainly, owing to the existence of a strongly arcuate dextro-convex scoliosis, which is distinctly seen in the ventrodorsal projection (Fig 6) In the lateral view, the scoliosis is responsible for the remarkable feature of the narrow ninth vertebra appearing projected over the eighth one In a similar manner, the features of the ventrodorsal picture are veiled by the gibbous formation so as to make it impossible to make out the details, and so that, for instance, the pathological ninth vetrebral body cannot be differentiated from its neighbors at all The small triangular shadow in front of that body is undoubtedly that of a reactive, reparatory osteophytic formation there

Calvé says that the case which came under his own observation (the second which he mentions having been communicated to him by the American, Dr Brackett) had for a long while been taken by him for one of spondylitis, and had been treated as such, until the child was Rontgen-photographed, when he immediately realized that it was *not* spondylitis It was the same with our patient In the flat, rudimentary vertebra, with the well-preserved intervertebral spaces toward its nearest neighbor on either side—which were likewise perfectly intact—there was nothing that resembled tuberculosis That disease very soon causes the intervertebral spaces to become affected, and it would seem absolutely inconceivable that a tuberculous process responsible for a pathological change as extensive as the one here observed should have left the vertebral pads intact When to this it is added that the change does not resemble a tuberculous process at all, that there are no signs of any gravitation abscess, and that Pirquet's test proved negative—then there is no reason for conjecturing tuberculosis to be the etiological factor in the present case Nor does caries from any other known cause seem to be a reasonable explanation. Calvé discusses the possibility of a Kummell's kyphosis, but only to reject it immediately, in the first place because there had been no traumatic element in his case, and in the second place because the existent anatomical abnormality did not in any way look like the result of a fracture The same must be said of our case The fracture of a vertebra can very well result in a reduction of its vertical diameter, but not in the manner observed here It will usually become assymmetrical and wedge-shaped, and the body broader than those of its neighbors, but it never could get the regular, disciform shape that it has in the present case

It therefore seems likely that—as Calvé suggests—we have to do here with a peculiar affection of its own, akin to Calvé-Perthes' hip disease, Koehler's disease of the navicular bone and some others

While Calvé believes that the flat vertebral shadow observed in his case represents all of the body of the vertebra, and that the disease, consequently, shows itself by "too little bone and too much cartilage," Harrenstein holds a slightly different opinion, in so far as he thinks that some of the seemingly broad space between the vertebræ may possibly be accounted for as non-shadow-giving por-

tions of the vertebral body He bases that opinion on the fact that in one of his two cases—which he examined at a rather early stage, that is, a couple of months after the first symptoms appeared—he saw *the whole* of the diseased vertebra, as a wedge-shaped body giving only a feeble shadow, somewhat smaller than the nearest vertebra on either side, and the intervertebral spaces a little smaller than the nearest corresponding ones It was not until later that the low, characteristic shadow appeared, and then separated from its neighbors by a wide intervertebral space on either side Harrenstein also sees a support for his opinion in the case observed by Brackett, because radiographs taken of the latter at an interval of eighteen months show the narrow vertebral shadow to have become broader, vertically, during that time He sees in that a circumstance pointing to the existence of some vertebral tissue not visible, in which the regenerative process may have started As to which theory is the right one—Calvé's or Harrenstein's—I shall express no opinion

A certain amount of difference does exist, at any rate, between the process here described and the other, presumably kindred affections already mentioned above. To compare this with Koehler's disease of the navicular bone, for instance, it has always been maintained as characteristic of the latter that the interspace between the talus and the cuneiforms is the same on the diseased and the healthy side, and that it remains so until the complete recovery which probably always takes place With the disease of the vertebra it is not so There it is at all events, a question of an actual diminution—in vertical diameter—of the diseased vertebral body, and in none of the cases published has there been a complete restitution *ad integrum* In all the cases, the latest radiograph taken shows—even when the clinical healing is to all appearances complete—a vertebra reduced in height, of somewhat irregular outlines, both upwards and downwards, and of a structure departing from the normal, generally somewhat consolidated

It is possible that these characteristic differences may be due to the distinctions in the statical conditions that obtain for the navicular bone and the vertebræ, respectively, the pressure on the latter being considerably greater and, therefore, not offering as good conditions for a complete restitution as in the case of the former In

other words, precisely the same argument that has been advanced as regards to Calvé-Perthes' hip disease, as an explanation of why that affection is less benign in its consequences than the navicular one

At any rate, our case—which must undoubtedly be classed in the same category as the four previously published, and which now offers the additional interest of having come under renewed observation eight years after the first symptoms appeared—proves that the disorder is by no means a slight one, but can result in considerable deformity and in grave inconveniences to the patient It furthermore shows that it is very difficult to say when a definite healing has taken place, seeing that, as a matter of fact, in this case the symptoms of the disease have existed—although exhibiting themselves with varying degree of strength—for nine years When the other cases published have received the notation "cured," it is possibly only because the subjects have not, like the patient in our case, been obliged to perform any work, and that, consequently, no great demands have been made on their powers of exertion, seeing that, at the beginning of their disease, they were much younger, namely—respectively—two and one-half (Calvé), seven (Brackett), and five and five years old (Harrenstein) With our own case in mind, I believe that a much longer period of observation is necessary before it is in any way safe to speak about a definite cure, and it may probably be taken for granted that the treatment should consist, for a very long time, in close observation and sparing the patient for any bodily exertion

It seems to me reasonable to suppose the existence of a special disorder, of its own distinctive character, which might suitably be denominated Vertebra plana (Calvé), a disorder in its clinical features strongly resembling a tuberculous spondylitis, but far milder in its course, and probably to be classed among the already numerous affections specific of juvenile growth, as a rule benign in character, still not infrequently followed by serious consequences, as is perhaps most frequently the case with the hip disease The lower thoracic vertebræ are the seat of the affection in all the cases published, and would, thus, appear to be the ones most liable to its attack Harrenstein suggests that probably not a few cases may have passed unrecognized, being taken for cases of spondylitis, but in that I do not believe he is entirely right The rontgenological

picture is so characteristic that any experienced rontgenologist would immediately have his attention arrested by it, and would realize the peculiarity of its features, even though one does not at once establish a new pathological entity on the basis of a single case

SUMMARY

The author reports a case, presumably of the kind which Calvé has described under the designation "vertebra plana" The affection can evidently be one of considerable chronicity, seeing that in the present case the first symptoms declared themselves nine years ago and the patient cannot be said to be well yet The Rontgen examination showed serious changes, namely, a pronounced kyphoscoliosis corresponding to the lower thoracic vertebræ, and a very much diminished vertical diameter of the body of the ninth of that series There were no signs of spondylitis or of any other known destructive disorder Though benign as compared with spondylitis, the affection can, thus, produce considerable changes, both pathological and anatomical, akin to what is observed in severe cases of Calvé-Perthes' hip disease It possibly belongs to the same category of juvenile growth diseases as the latter It will probably be a matter of difficulty to determine, in the individual case, when the disease has finished its course, and whether the existing symptoms are due to the affection itself or to its resulting consequences

LITERATURE

[1] CALVÉ "Sur une affection particulière de la colonne vertebrale chez l'enfant, simulant le mal de Pott," *Jour de Radiologie*, vol ix, p 22

[2] HABRENSTEIN "Eine eigentümliche Krankheit der Wirbelsäule beim Kinde," *Zeitschr für orthopäd Chirurgie*, vol. 48, p 77

TREATMENT WITH SANOCHRYSIN IN VARDAASEN SANATORIUM, ASKER, NORWAY

By ALB TILLISCH, M D
In Charge of the Vardaasen Sanatorium, Asker, Norway

VARDAASEN SANATORIUM is the property of Oslo municipality and receives only patients belonging to the city of Oslo The patients are admitted through Oslo Health Committee's tuberculosis section, which with its staff of doctors and nurses constitutes Oslo's tuberculosis dispensary When the patients are discharged from the sanatorium they come under the social and hygienic care of this dispensary

The sanatorium consists of three sections—a section for adults, having 136 beds, a section for children with pulmonary tuberculosis, having 100 beds, and a small section for scrofulous children, having 30 beds

The treatment consists first and foremost of the ordinary open-air cure, with a pronounced individualization of the various factors thereof Rest, walking exercise, physical training, corporal work and inurement to exposure This treatment is supplemented, when specifically indicated, by air-baths, sun-baths and light-baths (carbon arc-lamp and mercury-quartz lamp)

As regards surgical treatment, pneumothorax, thoracoplastic and phrenicus-exæresis are employed to a large extent

In the course of the last three years chemotherapy has been applied, in the form elaborated by Professor Mollgaard (Copenhagen) in his sanochrysin treatment, and I shall now give a survey of the results that have been attained by this treatment

At Vardaasen Sanatorium treatment with sanochrysin was commenced in November, 1924 It has since been constantly employed in selected cases The present lecture is based upon 63 patients in whom the treatment has been carried out to completion

In the beginning the dosage employed was that which was usual in the Copenhagen clinics, namely, a first dose of 0 50 gram, followed by doses of 1 gram. In no case, however, have I followed the principle of the short intervals, but adopted intervals of from

five to seven days This treatment with large doses was employed in thirteen cases This period was for the doctor a very instructive time for acquiring experience and for studying the character and mode of action of sanochrysin.

But the violent reactions and serious complications very soon demanded the solution of the question Is sanochrysin a chemotherapeutic that can unreservedly be assigned to the category of parasitotropic substances, or is it not rather a substance which, either itself or in the chemical combinations arising from its decomposition, has also an organotropic effect? What aroused a suspicion of this latter effect was especially the dermatitis which developed on a previously existing exanthema, and in the next place the stomatites, which would sometimes be very severe Finally, doubt was awakened as to the correctness of the supposition that the sanochrysin is rapidly excreted—within one week. In some of my patients exanthema and albuminuria appeared eight days and more after an injection, which pointed to a storing up of gold and a more slowly proceeding elimination. In one of the more recent cases there occurred a typical exanthema nine weeks after the last injection The character of the albuminuria, especially when occurring later on in the course of the treatment, with epithelium and casts and the abundant excretion of uric acid, often in the form of cylindroids, could not be plausibly explained as being due solely to a toxic effect of the liberated tuberculo-toxins

I could not free myself from the idea that the symptoms or, if we prefer to call them so, the complications of the sanochrysin treatment were to a material extent due to metallic poisoning It was the clinical observations that led to this conclusion The valuable investigations respecting the storage and elimination of sanochrysin, which were carried out in the Danish hospitals by Lomholt, Frandsen and Hansborg, had not at that time been published

The result of these reflections was a considerable reduction of the doses, and after the lapse of a short time a kind of standard dosage was arrived at in the sanatorium In afebrile cases, where the general condition is good and where the process is not very considerably diffused, we begin with 0 25 gr of sanochrysin and, if this dose does not produce any great reaction, we continue with doses of 0 50 gr, which are then given ten times, making a total

dosage of 5 25 gr The interval between injections is one week Thus my dosage coincides exactly with Doctor Wurtzen's

Where the general condition is less good, where the temperature stands at 37 6–7 or about 38° C, where the clinical observation points to a progressive tendency in the disease or where the process is greatly diffused, we proceed more cautiously, beginning with 0 10 gr and rising slowly to 0 50 gr, which dose is then given ten times Between the small doses the intervals may be shortened to four or five days O Helm's report of two deaths from sanochrysin also speaks strongly against the employment of the large doses

Such a standard method cannot, of course, be carried through in all cases. Where reactions and complications arise, or where the patient's condition on the whole demands it, the treatment must be individualistic both as regards the size of the doses and the length of the intervals The fact that I stop after a total dose of 5 or 6 grams is mainly due to the effect of the remedy on the kidneys and to the fear of dermatitis The farther we come in the treatment, the more regularly does albuminuria occur and the longer it lasts If the effect of the drug has not been so satisfactory as could be desired, we prefer to give a new, shorter series of five or six injections after a pause of about two months

It may now be asked Has this more cautious dosage ensured the patient against the sanochrysin's violent reactions and complications?

One thing is certain, the treatment can in the great majority of cases be carried through in a tranquil manner without appreciable disadvantages

Temperature reactions occur either not at all or with only a slight rise in temperature of short duration A high temperature reaction of two or three days' duration is extremely seldom seen.

The highly disagreeable effects on the stomach, nausea and vomiting, are, practically speaking, never observed Diarrhœa still occurs very generally, but only in a mild form, with two or three loose or granular evacuations in the course of twenty-four hours, and without distressing sensation The profuse diarrhœa caused by the large doses does not occur With the cessation of these symptoms the loss of weight which formerly was usual is also avoided Most of the patients now increase in weight during the cure The general condition is entirely unaffected We still find exanthema, but seldom

in the form of severe, universal, intensely itching and consequently very distressing eruptions And I have had no case of dermatitis with the dosage we now employ But exanthemata occur, both in the morbillous and scarlatina-like forms, and likewise eruptions with infiltration of the cutis and subcutis Especially in case of these latter we must be extremely cautious and not give any injection until every trace has disappeared, since it is especially the infiltrating eruptions that may develop into dermatitis Altogether sixteen patients had exanthema

The exanthema is quite erratic in its occurrence I have seen it appear after injection of 0 10 gr and a universal exanthema after the first half-gram dose In one case a typical sanochrysin exanthema occurred nine weeks after the last injection.

In some cases, and not so very seldom, there comes an eruption in the form of urticaria, and then usually with very large vesicles In one case there appeared a typical erythema nodosum

By far the most frequent complication is albuminuria, which is almost constant in its occurrence In only eight of my 63 cases has the treatment been carried through without its occurrence Most frequently it reveals itself only as a trace, as was the case with 43 patients, but in quite a large number it is more pronounced, with a distinct dense film on the surface of contact between the urine and the reagent (11 cases) The albuminuria most often appears later on in the course of the treatment and its duration is extremely variable, from one or two days up to a week or a couple of weeks In one case, after a total dose of 2 15 gr, there developed a chronic nephritis, in which the quantity of albumin rose to 10 per mille It still continues after the lapse of a year and is probably incurable. This was my only case of persistent albuminuria

Even when the albumin appears only as a trace, there can microscopically be detected leukocytes, epithelial cells and granular and hyaline casts, and these are of constant occurrence when the quantity of albumin is somewhat more abundant, and the remarkable thing is that casts can be detected even after every trace of albumin has disappeared

As a precaution, the injection of a new dose is postponed until every trace of albumin has vanished, indeed even if Heller's test reveals only a high ring (nucleo-albumins and chrondroitin sulphuric

acid) In this respect I am in agreement with Doctor Wurtzen, whereas Professor Bie is of the opinion that the treatment can be continued even when a faint trace of albumin is found

If the albuminuria persists for a long time, for weeks, the intervals between the doses may have to be long, but it does not seem to me that this has any decisive influence on the final result

A complication that is seldom mentioned, but which has occurred in very pronounced form in four of my cases, is violent rheumatoid or neuralgic pains, which may be very severe In one case continual pains, interrupted by sharper attacks of pain, completely prevented sleep at night, so that the patient became quite enfeebled In another case the pains lasted for three months, with exacerbation to very severe attacks, most often at night During the worst period the patient was unable to walk. In the remaining two cases the pains were somewhat less pronounced The most severe pains were in all cases localized to the lumbar region and the lower extremities, but also the shoulders and arms were in some degree affected There were no disturbances of motility nor anæsthesia Lasègue's symptom was in all cases negative

In connection with the complications arises the question of employment of serum Those of my readers who have employed serum according to the original scheme—before, together with or after the injections—will, I am sure, never forget the relief that was felt when it was found by experience that serum was in reality unnecessary Almost all clinicians have now arrived at this conclusion. No demonstrable result could be observed, while on the other hand, we had the great inconveniences, temperature reactions, serum exanthemata, infiltrations and pains My patients came to have an absolute horror of serum injections Wurtzen has described two cases, where, in his opinion, the fatal result was due to serum

The only authority who still employs serum to any great extent is Doctor Secher, but he maintains as the only correct mode of treatment the large doses with short intervals, at any rate between the first doses For him the important thing is within the shortest possible time to attain the highest concentration of sanochrysin that the organism can tolerate He enumerates five cases in which the employment of serum is indicated, namely, all cases of albuminuria, cases in which the disease is of long standing, cases where the tem-

perature after an injection rises from day to day, cases where toxæmia is present or where it may be supposed that a toxæmic condition will develop during the treatment, and finally in case of shock. Some support for the serum treatment is afforded by the latest experiments on animals at the Danish Serum Institute Sanochrysin treatment of tuberculous rabbits was carried out most successfully when serum was employed at the same time, but, it must be noted, a homologous serum A heterologous anti-tuberculous serum, on the other hand, is tolerated very badly by the animals To procure a homologous anti-tuberculous human serum, such as Professor Madsen mentions, would doubtless be practically impossible.

Besides in cases of shock, which, however, he has not experienced when using the more cautious dosage, Wurtzen employs serum in cases of albuminuria occurring in direct conjunction with an injection and which is assumed to be due to excretion of tuberculo-toxins, but not in albuminuria of later occurrence, which is supposed to be due to excretion of chemical combinations of gold I have not been able to convince myself of the advantage of serum in any form of albuminuria I have had cases of albuminuria in direct conjunction with an injection which disappeared after an injection of serum, but exactly the same thing occurred next time without use of serum. All are agreed that serum is the sovereign remedy in case of shock. I have not, however, had any such cases among my patients

The question now is Does the milder treatment yield a less satisfactory result than treatment with the large doses? My material is altogether too small to furnish an answer to this question by means of figures, as only thirteen cases have been treated with large doses Of these patients eight were discharged with a favorable result Of the remaining 50, who were treated with smaller doses, 32 were discharged with a favorable result, so that the proportion is about the same But these latter have undergone the treatment in a far more tranquil and agreeable manner, almost like all our other patients in the sanatorium. Those who are free from fever are up and out, pursuing the ordinary curative treatment, in the intervals between the injections

As to *the effectivity of sanochrysin* opinions are greatly divided In Denmark most clinicians are agreed as to its great therapeutic powers Outside Denmark the views are extremely varying A large

number of clinicians—to judge from publications, the majority—claim to have found no advantage in it, others share the Danish view At the congress recently held at Washington sanochrysin treatment did not come under discussion at all For the answering of this question I believe that my material is of no slight importance In this first period, which I have regarded as a time of experiment, I have employed sanochrysin only on patients who, after an ordinary sanatorium cure of from two up to nine months, either have presented no sign of improvement or have shown progression of the malady In the following table the duration of the previous curative treatment is stated. In the case of five patients the sanochrysin treatment was begun immediately after admission These had previously been in a sanatorium and had afterwards been under my control and they were admitted specially for sanochrysin treatment. In three cases the previous sanatorium cure had lasted less than two months, one of these was a girl aged fourteen with a more acute puberty phthisis, while the other two were advanced forms with rapid aggravation Of all it can be said that, according to my clinical judgment, nothing could be gained by continuing an ordinary sanatorium cure My material is arranged in tabular form All the patients had constantly had tubercle bacilli (T B) in the expectoration before the sanochrysin treatment was commenced

Of the 63 cases, when grouped according to Turban-Gerhard's system of division into stages, 5 belong to the first stage, 16 to the second and 42 to the third. Arranged according to Doctor Strandgaard's Rontgen stages, only 2 can be assigned to the first stage and 9 to the second, whilst 34 belong to the third and 16 to the fourth stage (radiograms are lacking in the case of two patients) Twenty patients present cavern pictures on the radiograms Thus the majority represent very severe forms of the disease Twenty-one were free from fever beforehand, 42 were febrile (whereof 25 subfebrile, 13 febrile and 4 highly febrile)

Of these 63 patients improvement has been attained in 40 cases, an improvement which in all of them consists in certain and lasting afebrility, in improved stethoscopic findings, good general condition and full capacity for work, a capacity for work which in the great majority of cases was tested by work cure in the sanatorium In 22 cases the bacilli disappeared from the sputum, and in 19 cases there

was clarification on the radiogram. For further details I may refer to the tabular statement From considerations of space I refrain from giving extracts from the records of cases

The fact that the tubercle bacilli disappear seems to me the best proof that sanochrysin is a chemotherapeutic that attacks the tubercle bacilli Even in cases which for years had been bacillary and had continued to be so during the sanatorium treatment, the bacilli have disappeared But I do not venture to believe in the possibility of a biological cure, a complete "sterilisatio magna" This is best shown by the fact that in a number of cases bacilli again appear in the sputum after some time, even where râles, coughing and expectoration have disappeared during the treatment This may especially occur in acute catarrh When the catarrh is cured, they again disappear in some cases, in others they may remain permanently In my material are reckoned as being free from bacilli only those who during the sanatorium cure after the conclusion of the sanochrysin treatment have remained abacillary (also on application of the antiformin method)

Where the bacilli have not entirely disappeared, they have however decreased in number We find some bacilli scattered here and there over the microscopic preparation (T.B +I), or else on some examinations we find none, on others a few This last has been the case with 10 of the 17 patients who had bacilli when discharged [1]

The influence of the sanochrysin on the amount of expectoration and thereby on the tuberculous process is seen from the table Eight patients have entirely ceased to expectorate, twelve others produce only a small clot in the morning, and a decrease in the quantity of sputum from 200 gr to a mere clot, from 175 to 15 gr and from 150 to 20 gr is also worthy of note

The importance of a clarification in the radiogram must be estimated with the greatest caution. All our pictures from the same patient were taken under similar conditions, at the same distance (150 cm), with the same time of exposure and with the same milliampere and kilowatt figures But variations may nevertheless arise through technical causes, for example, the use of an old or a new

[1] Secher maintains that the result attained when using small doses is more superficial, which is shown especially by the fact that the bacilli do not disappear After my results this reasoning does not seem to hold good

A Improved—Forty Cases

The State before Treatment										Notes during the Treatment	Result after the Treatment								Notes
Number	Sex and Age	Clinical Duration of the Disease in Years	Stages: Turban	Stages: Strandgaard Radiogram	Weight	Temp Low fever + Fever ++ High fever +++	Expectoration in Grams	Suspension Stability Sinking in First Hour	Sanatory Care before Treatment in Months	Ex. = exanthema A = albuminuria Tr A = trace of albuminuria D_1 = mild diarrhœa D_2 = profuse diarrhœa E n = erythema nodosum St = stomatitis Vo = vomiting	Weight	Temperature	Expectoration	Suspension Stability	Tubercle bacilli TB + I, II, III, IV	Stethoscopic finding + Improved + Unchanged	Radiogram + Clarification + No Clarification	+ Capacity for Work + No Capacity for Work	
1	W 26	1 1/12	I	I	72 2	+	5	37	2	Tr A D_1 2 series	66 5+5 7	+	2	10	+	+	+	+	First series completed 7/22 TB + 9/2 taken cold TB + Second series completed 11/1 12/10 no exp
48	M 20	1/12	I	I	73 2	+	10	6	4		68 8+4 4	+	1 kl	2	+	+	+	+	Last dose 9/18/26 12/10/26 TB + crepitation after cough
63	M 32	1 1/12	I	II	72 0	+	30	11	3½	Tr A	71 8+0 2	+	1 kl	7	+ + I	+	+	+	Where before many râles No cough No râles Last dose 6/11/25
60	W 60	1/12	I	III	52 2	+	25	76	2½	Great dosages 2 series Tr A.	63 3+11 1	+	+	32	+ + I	+	+	+	Ex pleurisy before series II 3/6/26 last dose 5/1/26 crep after cough
64	W 22	1 1/12	I	II c	69 2	+	1 kl	35	0	First series in Ullevaal 0 25 gr in 20 inj	69 1+0 1	+	+	26	+	+	+	+	Last dose 6/18/26 A couple of râles after cough in the top
3	M 33	1½	II	III	60 6	+	40	24	5	Tr A.	77 9+17 3	+	10	2	+	+	+	+	Last dose 2/8/26 5/4/26 some râles after cough
6	M 20	1 1/12	II	III	66 1	+	50	41	7	Ex very high fever six days after 0 20	70 7+4 6	+	10	18	+	+	+	+	Last dose 5/4/25 Small crep 4/18/26 TB + Healthy 9/28/26 W 81 0 kg
10	M 18	1	II	III	63 4	+	30	10	0	Tr A D_1 Great dosages A D_1	66 0+2 6	+	3	4	+	+	+	+	Last inj 6/3/25 10/15 unchanged physic TB + R.L pn. th act Last dose 2/9/26 12/7/26 Healthy Unchanged physic TB +
23	W 30	1/12	II	II	44 5	+	25	22	0	Large doses Violent temp after 0 50 Ex. Tr A Pains of the joint	53 7+9 2	+	1 kl.		+	+	+	+	Last dose 2/23/26 10/16/26 Unch physic, dry râles Is working
31	W 26	1/12	II		56 7	+	30	43	2	Tr A Headache Tr A.	59 0+2 3	+	+		+	+		+	Last dose 4/24/26 6/20/26 crep where before râles
40	W 22	1 1/12	II	II	61 2	+	5	39	0	Tr A after one injection D_1	63 8+2 6	+	+	33	+	+	+	+	Last dose 10/12/25 1/14 well off TB +

43	W	27	5/12	II	II	60	+	5	27	3½	Tr A D1 Local reaction after the first doses Exp 175	68 0+8	+	+	13	+	+	+	+	Last dose 12/17/25 6/14 well off Is working Râles after cough in the top
46	M	42	1 1/12	II	II	66 7	+	30	8	5	Tr A Violent neuralgic pains. Tr A	70 8+2 1	+	+ 1 kl	7	+	+	+	+	Last dose 1/14/26 5/20 well off Is working Dry râles in r top
50	M	28	1	II	III o	67 8	+	25	23	4	Tr A D1 Conj phlyst	76 8+9 0	+	1 kl	6	+	+	+	+	Last dose 2/10/26 4/23/26 Is working Dry râles
62	W	38	2 5/12	III	II c	61 2	+	25	20	8	Tr A D1	70 5+11 3	+	1 kl.	15	+	+	+	+	Last dose 1/29/26 9/16/26 W H.1+10 km
14	M	23	2	III	IV	76 6	+	50	4	6	Universal Ex. deep plaques without temp and A.	87 9+11 3	+	1 kl.	3	+	+	+	+	Last dose 1/29/26 5/14 some râles after cough
17	M	15	5/12	III	III	43 8	+	15	4	0	Tr A. D1	53 5+9 7	+	+	12	+	+	?	+	Kompl larynx.
19	W	14	11/12	III	III	56 0	+	15	32	1	Tr A Tr A D1	54 0+2	+	3		+	+	+	+	Sometime pn. thorar treatment Crep in the tops, where before many râles.
30	W	25	5/12	III	III	67 0	+ +	15	24	2½	Large doses Ex. A. Vo D1	68 5+1 5	+	+	28	+	+	+	+	2 series Last dose 6/11/25 11/30/26 has been afebrile. v +2 6
37	W	26	2	III	II	59 4	+ +	300	47	9	Large doses A	54 7+4 6	+	1 kl.	9	+	+	+	+	Last dose 6/19/25 Dec. 26 is still living
51	M	19	11/12	III	III	76 0	+ +	30	26	5	Ex A Large doses	76 2+0 2	+	+	19	+	+	+	+	1½ years without symptoms Capable of work July 26 Exacerbation. TB+ Renewed cure TB+
58	M	34	1 5/12	III	III	74 7	+	125	11	2½	Ex. A of long duration	75 7+1 0	+	25	4	+	+	+	+	Without symptoms Last dose 6/10/26 10/11/26 no symptoms No exp
5	M	31	11/12	II	III	66 2	+	175	12	0	Tr A D1	77 0+10 8	+	15	3	+ + I	+	+	+	No râles Sometimes a very little clot
45	M	24	1	II		75 7	+	100	15	3	Tr A D1.	81 0+5 3	+	20	5	+ I	+		+	Râles disap No cough Very seldom a little clot
47	W	22	11/12	II	II o ?	49 4	+	2 kl	38	6	Tr A. Large doses Ex. Vo Tr A.	44.9+4 5	+	1 kl	27	+ I	+	+	+	A single râle Last dose 1/5/25 3/11/26 no symptoms
28	W	17	7/12	II	III	50 0	+ +	30	36	3	Large doses Urticaria Vo Tr A Extrasystole	57 8+7 8	+	1 kl	47	+ + I	+	+	+	Last dose 2/6/25 9/9 healthy TB+ W +1 3 kgs
7	M	24	11/12	III	III	61 2	+ +	100	12	6½	Large doses Local Ex. Tr A	69 9+8 7	+	25	5	+ I	+	+	+	Last dose 8/10/25 1/7/26 during a cold TB+Nov 26 No cough Capable of work.
11	W	37	16	III	IV	72 0	+	30	43	0	Tr A.	67 7+4 3	+	15		+ + I	+	+	+	Last dose 9/4/25 1/29/26 during cold TB+
35	W	42	4 5/12	III	IV	61 0	+ +	60	41	fl ar	Tr A. First sery Ullevaal. 20 inj 9 5 grams	62 5+1 5	+	15	22	+ + II	+	+	+	Second day Vardasen last dose 11/25/25 4/7 no râles No op
36	M	24	5/12	III	III	70 8	+	40	38	5		65 6+4 2	+	20	17	+ I	+	+	+	Last dose 4/6/26 No op till 10/13 then a clot with TB+ Some râles in the top

A Improved—Forty Cases—Continued

The State before Treatment										Notes during the Treatment	Results after the Treatment								Notes
Number	Sex and Age	Clinical Duration of the Disease in Years	Stages: Turban	Stages: Strandgaard Radiogram	Weight	Temp Low fever + Fever ++ High fever +++	Expectorate in Grams	Suspension Stability Sinking in First Hour	Sanatory Care before Treatment in Months	Ex. = exanthema A. = albuminuria Tr A = trace of albuminuria D1 = mild diarrhœa D2 = profuse diarrhœa E n. = erythema nodosum St = stomatitis Vo. = vomiting	Weight	Temperature	Expectoration	Suspension Stability	Tubercle bacilli TB + I, II, III, IV	Stethoscopic finding + Improved ++ Unchanged	Radiogram + Clarification ++ No Clarification	+ Capacity for Work ++ No Capac. for Work	
38	M 26	1	III	III	65 8	+	15	26	2½	Tr A D1 by D2	74 2+8 4	+	1 kl	15	+ + I	+	+	+	
22	M 25	1 ⅓	III	III c	76 1	+	50	20	3	Tr A Pn. th tried.	76 0+0 1	+	20	22	+ + I	+	+	+	Last dose 4/29/26 No op till 7/25/26 during cold 8/3 TB + Rarely crep A C in the r top
27	M 40	⅓	III	III c	80 4	+	30	26	3		85 6+5.2	+	30	7	+ I	+	+	+	Last dose 5/26/26 8/31/26 no op. A single râle in l top
29	M 22	1 ⅓	III	III c	66 4	+	50	25	4	No reactions	72 6+6.2	+	15	4	+ + I	+	+	+	7/15 Ex. 51 days after last inj
32	M 29	⅓	III	III c	63 4	+	150	29	1½	Tr A	66 8+3 4	+	20	21	+ + I	+	+	+	6/9/26 last dose 9/2/26 TB + Some crep
33	M 29	1 ⅓	III	III c	62 9	+	30	3	1½	Tr A Exp with basilicon eight months before treatment.	61 1+1 8	+	20	11	+ I	+	+	+	A C at r base
34	M 38	4	III	III c ?	69 0	+	30	7	5½	Large doses D1	85.2+16.2	+	35	3	+ II	+	+	+	Last dose 6/24/25 8/14/25 some crep A. C in the tops TB +
53	W 21	⅓	III	IV	63 6	++	75	61	1	Pn. th puberty phthisis No reaction.	64 1+0 5	+	15	29	+ + I	+	+	+	8/6/25 last dose 10/27/25 op + Some crep A cough in r top
55	W 20	⅓	III	III c	59 2	+	75	55	3	Pn. th puberty phthisis E n affection 12 injections D1	60 7+1 5	+	25	25	+ I	+		+	Reson. râles to 3 c
61	M 27	⅓	III	III	73 8	+	15	50	6		69 6+4 2	+	+ 1 kl	35	+ + I	+	+	+	Last dose 9/25/25 3/20/26 taken cold TB + 4/6 well TB + and no op till 11/1/26 then again taken cold and TB + Crep on the tops 12/23/26 TB +

B Unchanged—Fifteen Cases

	W	20	5/12	III	IV o	67 4	+	40	26	4	Tr A ˉD₂.	57 4+10 0	+	20	49	+ III	+	+	+	Last dose 1/18/26 7/8/26 no op Crop after C in the tops before treatment l l râles everywhere n r l to 2 c and any to
12	W	20	8/12	III	IV	60 0	+	40		4	Tr A. D₁	54 6+5 4	+	30		+ II	+	+	+	Last dose 5/6/26 9/14 TB+ A single râle after c on l back
15	M	26	2	III	IV o	63 0	+	30	28	5½	Large doses Urticaria Tr A. Vo	60 9+2 1	+	40	18	+ IV	+	+	+	Last dose 6/23/25 Still living Dec 26
18	M	24	1	III	IV o	58 0	++	40	17	3½	Tr A	56 1+1 9	+	40	33	+ I	+	+	+	R. L pn. th act L L pneumonia case Last dose 10/2/25 12/23/26 W 60 Always afebrile, approved stethoscopic finding
24	M	24	4 8/12	III	IV	69 9	++	26	25	24	Tr A arrived with pn th act	Died two days after operation								
25	M	29	8	III	IV	79 0	+	150	4	5	Tr A	84 4+5 4	+	200		+ I	+	+	+	Last dose 11/20/25 Died 11/28/26
26	W	24	1 4/12	III	III o	58 0	+	50	18	8	Ex. St A.	58 0+0	+	35	30	+ II	+	+	+	Last dose 11/19/25 Still living Dec 26
41	M	39	6 ½	III	IV o	68 0	+	75		0	St Tr A. D₁	67 4+0 6	+	40		+ I	+	+	+	Last dose 4/7/26 Dec 26 unchanged Always afebrile.
42	W	22	1 ½	II	III o	60 3	+	40	25	3	Urticaria Tr A D₁	63 2+2 9	+	10	19	+ I	+	+	+	After sanochrysin cure pn. th act with good result.
44	M	19	8/12	II	III	81.2	+	15	48	3	Tr A Rheumatoid pains.	72 1+9 1	+	15	24	+ II	+	+	+	Last dose 5/1/26 Dec 26 still living
49	W	23	8/12	III	III	70 0	++	25	83	6	Tr A In 14 inject 3 8 grams so	62 8+7 2	++	100	74	+ I	+		+	Treatment given up owing to receded fever
52	W	17	5/12	III	III	59 0	+	1 kl.	27	2	Ex.	54 6+4 4	+	40		+ I	+		+	Pn. th. act after sanochrysin cure.
57	W	24	5/12	III	III	54 5	+	15	40	1	Tr A. Rheumatoid pains.	54 8+0 3	++	15	55	+ I	+		+	Febrile.
56	M	20	1 8/12	III	III o	59 7	+	75	51	5	Tr A. D₁	70 6+109	+	20	20	+ I	+		+	Improved health Unchanged stethoscope Pn. th act
59	W	16	5/12	III	IV	47 5	++	50	58	2	A In 7 inject. 2 10 gr so D₁.	46 8+0 7	++	150		+ I	+		+	Treatment given up Too sensitive

C Aggravated—Four Cases, All Women

8	W	24	11/12	III	IV	69 8	+++	25	105	5½	Ex. Vo 3 20 grams in 9 doses	57+11 8	+++	60		+ IV	+		+	Kompl the intestine
9	W	35	4	III	IV o	55 9	+++	200		13	A D₂ Tachycardia 2 05 grams		+++	150		+ IV	+		+	Given up 1923 Thoracoplastic Died 8/19/25 in hemophysis
21	W	21	1 1/12	III	III	51.2	++	40	40	7	Tr A St	— —	+++	40		+ I +	+		+	Constant propagation Kompl. with ex. pleurisy Dec 26 still living
39	W	17	11/12	III	III	54 7	++	30	26	3	Tr A. D₁ Hemophytes 2 grams in 7 d	48 0+0 7	++	50		+ I	+		+	Last dose 3/1/26 Died 5/26/26

D Aggravated Essentially Consequent to the Treatment with Sanochrysin—Four Cases

The State before Treatment										Notes during the Treatment	Result after the Treatment								Notes
Number	Sex and Age	Clinical Duration of the Disease in Years	Stages: Turban	Stages: Strandgaard Radiogram	Weight	Temp. Low fever + Fever ++ High fever +++	Expectorate in Grams	Suspension Stability Sinking in First Hour	Sanatory Care before Treatment in Months	Ex = exanthema A. = albuminuria Tr A = trace of albuminuria D_1 = mild diarrhœa D_2 = profuse diarrhœa E n. = erythema nodosum St. = stomatitis Vo = vomiting	Weight	Temperature	Expectoration	Suspension Stability	Tubercle bacilli TB + I, II, III IV	Stethoscopic finding + Improved + Unchanged	Radiogram + Clarification + No Clarification	+ Capacity for Work + No Capac for Work	
2	W 21	$\frac{5}{12}$	III	III c	66 2	+	50	20	3	Large doses Dermatitis A St. ulcerosa.	53 0 + 8 2	+ +	150		+ II	+	+	+	Cachexia owing to dermatitis and St
10	W 25	1	III	IV c	56 2	+ + +	40	14	4	Doses from 0 10–1 gram Ex. Tr A D_1 Pains	57 3 + 0 9	+ +	100		+ II	+	+	+	Cachexia owing to violent pains
13	W 33	1 $\frac{2}{12}$	III	III	44 5	+	50	65	2	3 inj (0 25–0 50–0 75 gram) dermatitis St. A D_2		+ + +	150		+ IV	+		+	Died two months later
20	W 22	$\frac{7}{12}$	III	III c	48 4	+	50	30	2	6 inj in all 2 15 grams Nephritis present.	47 4 + 0 1	+	40	86	+	+		+	Cachexia owing to reced dermatitis and St Died one month later

developer, its temperature, time of development and the like But undoubtedly there is in a number of cases an unquestionable clarification, and when this occurs in the course of a comparatively short time it must be ascribed to the effect of the sanochrysin

In the suspension stability of the blood we have a very good test of the activity of the morbid process Of the 40 patients who were discharged in improved condition this test was for some reason or other not made at the time of discharge in four cases As regards the remaining 36, the stability improved in 33 of them, the sinking velocity had become quite normal in 14 patients, in six it lay on the boundary of the normal value, while in 16 cases it was still too high, but had, however, decreased as compared with the velocity before the treatment

To enter into a description of the stethoscopic findings is not feasible within the limits of this paper

In the temperature conditions, in the situation as regards the sputum and the bacilli, in stethoscopy, suspension stability and weight (and the gain in weight in case of the improved patients was far greater than the average increase observed in the inmates of the sanatorium) we have the more objective symptoms of the patients' condition But hereto must be added as a very important factor in the estimation of the situation the doctor's clinical judgment, and this judgment has been very critical

Fifteen patients were discharged in *unchanged* condition In these cases the sanochrysin has had no influence on the tuberculous process They were all advanced forms of the disease, two belonging to the second stage, the rest to the third stage, and according to the radiograms eight must be assigned to the third and seven to the fourth Rontgen stage Seven had caverns, while eleven had been febrile prior to the treatment From the experience I have since gained I believe that six of these ought not to have been treated with sanochrysin, and in two cases the cure could not be carried to a conclusion at all.

In certain respects several of these patients showed improvement. Thus seven of them had become afebrile, coughing and expectoration had decreased in some, the suspension stability had improved in a few of them and the stethoscopic findings in four cases But the clinical judgment of the situation did not permit of their being

entered in the category of improved patients Some of them, however, to judge from a subsequent control examination, have remained unchanged and afebrile for up to one year

The next group, four patients whose condition on discharge was *aggravated,* is of no interest for our present purpose These were febrile, far advanced cases, in which the process progressed without being influenced by sanochrysin

Greater interest attaches to the last four cases, where the aggravation must undoubtedly be ascribed to the complications induced by the sanochrysin In the first of these, a febrile case with an enormous cavern, which ought not to have been treated with sanochrysin, the condition was aggravated by the violent pains I have mentioned above when speaking of complications

In two cases there occurred a severe universal dermatitis, with intolerable itching, great desquamation and frequent recurrence with high temperature. At the same time there were deeply penetrating stomatites with plaques and ulcerations on the cheek, palate, tonsils and pharynx as far down as could be seen, and œdematous swollen lips with rhagades These complications occurred in the one case after the seventh injection and a total dosage of 6 50 gr and in the other case already after the third injection and a total dosage of 1 50 gr It is clear that complications such as these must break down the patient's general health, and as a matter of fact the final result was a completely cachectic condition. The last-mentioned case, where grave metallic poisoning occurs after a total dosage of 1 50 gr, also shows how incalculable is the action of sanochrysin. The fourth case also affords proof of this After a very cautious dosage, 2 15 gr altogether, distributed over six injections with a maximum dose of 0 50 gr, there occurred a nephritis which ended in a chronic incurable condition.

From the results of this series of experiments it is my decided impression that in sanochrysin we have got a remedy which in a relatively large number of cases produces an undeniable improvement where ordinary sanatorium treatment does not lead to the goal But sanochrysin is uncertain in its action in chronic tuberculosis in man and on account of the pathologo-anatomical conditions is hardly likely to lead to the results attained in the acute experimental tuber-

culosis in animals This uncertainty warns us to caution in the dosage

It now remains for us to consider in what cases sanochrysin can be employed and what cases ought to be excluded from treatment

In the voluminous literature on the subject we find it constantly repeated that the cases which are best suited for sanochrysin treatment are the exudative forms, or, as it is usually expressed, the essentially exudative forms, since the word "essentially" gives expression to the fact that practically no form is purely exudative or purely productive

But have we now a symptom complex that admits of a qualitative diagnosis, clinically *à la* Aschoff, Albrecht-Frankel and others, or rontgenologically *à la* Graff-Kuepferle? Ziegler and Curschmann, in their works on "Die Frage der qualitativen Diagnose und Einteilung der Lungentuberkulose," pointed out that the diagnoses made beforehand have on post-mortem examination proved to be erroneous in almost all cases. The two forms are always intermixed, sometimes the one, sometimes the other being predominant, but not in such manner that we can speak of an absolute predominance of one form and really make a qualitative diagnosis A purely exudative form occurs only in the extensive caseous pneumonias, a purely productive form only in miliary tuberculosis

For judgment of the given individual case we have recourse to Turban-Gerhard's division into stages according to diffusion, and supplement this by ascertaining the seat of the process in the lungs, its stage of progress (latent, stationary, progressive), the state of the body temperature and finally whether we have an open or a closed form of the disease With a good rontgenogram in hand we can further distinguish whether it is a cirrhotic, a pneumonic or a disseminated form, with or without caverns

These are the considerations that have guided me in the selection of cases for sanochrysin treatment

The mild afebrile and abacillary cases I have entirely excluded The prognosis for these cases is in general good with ordinary sanatorium treatment As a rule we succeed in reducing the process to the latent, clinically cured state, and more than this can hardly be accomplished with sanochrysin. A weighty argument against sanochrysin in these cases is the uncertainty as regards complications,

especially renal affections Not until the chemotherapeutic treatment has been so greatly perfected that we are safeguarded against these complications can there, in my opinion, be a question of treating these mild cases Neither is there any inducement to adopt sanochrysin treatment in bronchial-glandular tuberculosis, or in pleuritis, except in purely exceptional cases

In the milder bacillary forms I use sanochrysin when after a period of observation under sanatorium treatment it is found that expectoration and bacilli still persist and when stethoscopy reveals no sign of improvement

In more advanced forms such complications as intestinal tuberculosis and renal affections are counter-indications

Otherwise as regards the more advanced forms, a very good general state of health must be demanded The organism must have sufficient strength to react to the increased demands made upon it by the treatment Extremely cachectic individuals are as a rule also highly febrile, and it will be seen from the table that in highly febrile patients no result has been attained. Such patients I now exclude altogether from sanochrysin treatment. A subfebrile temperature, standing at from 37 6 to 37 8° in the evening, or a febrile temperature of about 38° does not constitute a counter-indication Thus amongst my patients who showed improvement fourteen were subfebrile and six febrile. But experience has taught that it is advantageous to keep these patients for some time under the quiet and healthy conditions of sanatorium life before commencing the treatment, and best of all is, if possible, to attain afebrility beforehand

If there are large caverns with symptoms attendant thereon, sanochrysin treatment alone is, according to my experience, without result In such cases, when only one lung is affected, I combine the sanochrysin treatment with artificial pneumothorax, or eventually thoracoplastic.

Neither the age of the process nor its diffusion are of any decisive importance for me, if only the general condition is good and none of the above-mentioned counter-indications are present

In the very old chronic cases we may often get the impression that an abundant connective tissue has developed in and around the tuberculous foci and that the sanochrysin cannot reach these parts so poorly supplied with blood-vessels On this point we as yet know

nothing with certainty, and pathological anatomy teaches us that also in such cases there exist exudative foci Amongst my material there is one case (No 11) in which the tuberculosis had lasted for sixteen years, with symptoms of activity during the whole time, although there were occasional remissions and exacerbations One lung shows in its entirety a shrunken and indurative condition, whilst in the other the processes are fresher, with large or small infiltrations It was undoubtedly these latter that had occasioned a very serious exacerbation In this patient freedom from bacilli was not attained during her stay in the sanatorium, but in all other respects there was considerable improvement On control examination one year later her condition was the same as when discharged, but no bacilli could be detected

On the other hand, I have not been able to observe any effect from sanochrysin when the condition was purely exudative In one patient (No 18), who was treated with artificial pneumothorax on the left side, there suddenly occurred a lobar caseous pneumonia in the right lung When the acute, highly febrile stage was over, sanochrysin treatment was commenced.

I have had no cases of meningitis or miliary tuberculosis So far as I have seen in the literature, no cured case of undoubted meningitis has been reported Wurtzen, on the other hand, has mentioned two cured cases of miliary tuberculosis We ought therefore in such cases to try sanochrysin as a last resort

The effect of sanochrysin is no doubt as yet uncertain But it represents nevertheless, according to my experience, a valuable aid in the treatment of pulmonary tuberculosis and thus denotes an important step forward on the right path But it is as yet only an auxiliary and has not disturbed the fundamental principle for all our treatment of tuberculosis, namely, the general treatment

TULARÆMIA *

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TULARÆMIA is one of the few diseases which has been worked out in its entirety by American investigators.

Definition—Tularæmia is a specific infectious disease caused by the *Bacterium tularense* It is primarily an acute, fatal bacteræmia of wild rodents, human infections not being necessary for its propagation Transmission to man occurs by bites of infected insects Infection also follows the contamination of the human skin or conjunctiva by infected tissue, fæces, or body fluid from infected rodents, flies, or ticks Clinically it is characterized by fever, prostration, and usually by a subacute or chronic involvement of the regional lymph-glands

Geographic Distribution—Human cases have been reported from twenty-seven states extending from coast to coast and from the Canadian to the Mexican border, from Washington, D. C, and from Japan.

Bacteriology—*Bacterium tularense* is a small pleomorphic organism, bacillary, coccidial, and bipolar forms being found It does not form spores and is non-motile It stains well with aniline-gentian violet, and in tissues with Giemsa's solution. It is Gram-negative Growth occurs only under aerobic conditions. No growth occurs on ordinary laboratory media but it grows quite readily on coagulated egg-yolks and blood-glucose cystin agar Heating to 58° C for ten minutes kills the organism in tissue or culture Thorough cooking of infected tissue renders it harmless Chemical antiseptics, such as trikresol, readily render it non-virulent.

Isolation of Bacterium Tularense from Man.—So far it has not been isolated directly from man on culture media, nor has it been found in cover-glass preparations direct from human tissue It has always been necessary to inoculate guinea-pigs or rabbits with human

* For one of the earliest articles upon this subject see "Tularæmia A New Disease of Man," INTERNATIONAL CLINICS, vol II, Series 33, p 72, by Edward Francis, M D, a pioneer worker in this field.

tissue and obtain a culture from these animals In order to inoculate animals the suspected pus should be rubbed in a mortar suspended in salt solution and injected subcutaneously on the abdomen of guinea-pigs or rabbits During the first week of the disease, when bacteræmia is present in man, blood may be mixed with an equal volume of normal salt solution and 4 to 8 c.c of the diluted blood injected into the peritoneal cavity of guinea-pigs The experimental animals die within a week and show a caseation of the enlarged lymph-glands and multiple minute white areas of focal necrosis over the spleen and liver Cultures of the *Bacterium tularense* may be obtained by inoculating coagulated egg-yolk or blood-glucose cystin agar with blood, spleen, or liver of these animals However, it is well to note that extreme caution should be observed in the handling of these experimental animals as it seems almost a certainty that all laboratory workers become infected with tularæmia

Occurrence in Nature —Various wild and domestic animals have been found susceptible in varying degree, but primarily it is a disease of wild rodents. The jack, cottontail, and snowshoe rabbits, ground squirrels, and rats have been found infected in nature Most of the human cases have been traceable to rabbits, probably because of the frequent human contact due to their use as food

Parasites which have been known to transmit the disease among rodents are The wood-tick (*Dermacentor andersoni Stilis*), which becomes infected when feeding upon a diseased animal and harbors the infection in its various stages of development, even carrying the infection from one season to another The same is true of the rabbit tick (*Hæmaphysalis leporis-palustris*) In addition the rabbit louse, the mouse louse, the squirrel flea, and the deer fly (*Chrysops discalis*) may aid in continuing the infection among animals

Means of Transmission to Man —There are several means by which the infection is transmitted to man.

(1) Through the bite of an infected wood-tick which has previously acquired the infection from some infected host It is not known whether the bite of the tick or the infection of the wound by the highly infectious excrement is the actual instrument of infection Cases due to this cause are most common from March to June, inclusive, which is the period of greatest adult tick activity, and only occurs in the localities in which these species of tick are found,

particularly in Montana, Wyoming, Idaho, and Utah Such cases are more common in the sagebrush sections where jack rabbits are plentiful

(2) Through the bite of the deer fly, which acts as a mechanical carrier of the infection after having bitten an infected animal without itself being infected. This source of infection is also limited to the range of the deer fly Cases from this cause have been reported from Oregon, Utah, Idaho, Wyoming, Colorado, and Montana In contradistinction to the wood-tick bite, which may occur on any part of the body but most frequently on the lower extremities, the deer fly bite occurs most often on exposed portions, principally the head and neck Cases from this cause have been reported during the months of June, July, August, and September

(3) Bite of animals The disease may be transmitted by an animal bite, in which case the animal's teeth may act as a mechanical carrier, or the animal may itself be suffering from the disease and its saliva may therefore be infectious A personal case was the first one of this type to be reported and was due to the bite of a young coyote Other human cases have been reported due to the bite of a ground squirrel and hog

(4) The most common means of human infection is the contamination of the hands or skin, or the conjunctival sac, with tissues or body fluid of infected rabbits, ticks, or excreta of infected ticks The most common source of such infection is from the dissection or dressing of infected jack or cottontail rabbits East of the Mississippi, where jack rabbits are unknown, most of the cases have been due to the handling of cottontail rabbits and have occurred mostly during the months of November, December, and January West of the Mississippi, particularly in the mountain states, jack rabbits are the more frequent source of contamination and such cases have been reported more commonly in the spring and summer months While many such reported cases have shown infection in the site of some previous abrasion, yet there are numerous cases in which no known abrasion was present, and apparently the organism is capable of passing through the unbroken skin before causing infection. Cases of infection originating in the conjunctival sac through contamination are quite common, the fingers having carried the infection to the eye In the area in which the wood-tick is found, a number

of cases have apparently followed the picking of ticks from domestic stock (particularly horses), the fingers then carrying to the eye some of the excrement of the tick or crushed tick tissue, either of which is capable of being highly infectious

TABLE I

Summary of Sixteen Cases of Tularæmia from Southeastern Montana

Mode of Transmission to Man		Summary of Type	
Tick bite	5	Ulceroglandular	10
Dressed jack rabbit	4	Oculoglandular	2
Picked tick from horse	2	Glandular	3
Coyote bite	1	Typhoidal	1
Scratch of hand	2		—
Undetermined	2		16
	—		
	16		

Occupation—Farmers, ranchers, and those exposed to ticks and flies, and likely to handle wild rabbits, furnish the largest number of cases Market men, housewives, and cooks are next Hunters and laboratory workers have had a considerable number of cases

TABLE II

Summary of Sixteen Cases of Tularæmia from Southeastern Montana

Sex		Occupation	
Male	12	Rancher	4
Female	4	Farmer	3
	—	Sheepman	2
	16	School children	3
Age		Laborer	2
Youngest	8	Housewife	2
Oldest	63		—
			16

Sex—Francis reports 167 males and 52 female cases, this probably is due to the fact that males are more commonly exposed to the various means of transmission. Cases have been reported as young as two years and as old as seventy-three.

Pathology—Most animals show a profound bacteræmia, enlargement and caseation of regional lymph-nodes, together with minute areas of focal necrosis in the spleen, liver, and lungs The pathology in man is usually of a subacute or chronic nature, the lesions in man being of a granulomatous type and pathologically they often simulate closely the lesions of tuberculosis Microscopically the lesions show areas of focal necrosis with central caseation, surrounded by a zone

of epithelial cells and fibroblasts, surrounding which is a zone of lymphocytes and a few giant cells Early in human infections a bacteræmia is present. Blood changes are not constant nor of diagnostic value, but a slight leukocytosis may be present.

Clinical Types—Francis classified the disease in four types

(*a*) The ulceroglandular, characterized by a primary papule which later breaks down into an ulcer, with enlargement of the regional lymph-glands (*b*) The oculoglandular primary as a violent conjunctivitis with enlargement of the regional lymph-glands (*c*) Glandular, no primary lesions but with enlargement of regional lymph-glands (*d*) Typhoidal, without either primary lesions or glandular involvement

Symptomatology—The incubation period is from one to nine days, three days, however, being the average The onset is usually sudden and severe, with headache, muscular pains, and prostration. Chills, vomiting, and sweating may be present. Fever of a moderate degree is an early symptom

Ulceroglandular Type—Usually within two or three days after the onset there is pain in the region of the lymph-glands draining the site of infection About one day later a papule, which is inflamed, appears at the site of the infection, later this papule breaks down and leaves an ulcer having elevated edges and a punched-out appearance The regional glands tend to enlarge, the skin over them becomes reddened, and later, usually after several weeks, the glands may break down and fluctuation become apparent beneath the thinned-out skin. In other cases suppuration does not occur but the glands may remain swollen and tender for two or three months, after which time they slowly return to normal In a number of cases subcutaneous nodules, which have been erroneously diagnosed as sporotrichosis, have appeared between the papule and the regional lymph-glands The acute stage of this type usually lasts two or three weeks, during which time there is likely to be a remittent fever of a low grade with marked weakness and prostration

Oculoglandular Type—In these cases the primary infection occurs in the conjunctival sac and there is usually marked swelling and chemosis, and profuse watery or purulent discharge, and with this, swelling and tenderness in either the pre-auricular, parotid, submaxillary, anterior cervical or axillary glands, and small discrete

ulcers appear on the conjunctiva, and the cornea may be involved. The constitutional symptoms are much like those of the preceding type but may be more severe, and convulsions, delirium, and stupor have been noted In one instance, reported by Francis, four members of a family apparently infected from wild cottontail rabbits developed this type of the infection and three of them died at the end of about a week, the infection being present in both eyes, while in the fourth member of the family who recovered, it was unilateral

Glandular Type—This may follow the dressing of infected rabbits and is characterized by symptoms like the ulceroglandular type but with the absence of the primary papule and ulcer on the hand

Typhoidal Type—Most cases of this type have occurred among laboratory workers, although one of our series was of this type There is no enlargement of the regional lymph-glands, nor is there any primary papule or ulcer Fever is the most prominent symptom, and clinically these cases very closely resemble typhoid fever, being differentiated from it by the rather sudden onset, the negative Widal, and the positive agglutination test with the *Bacterium tularense* The constitutional symptoms are very similar to those of the ulceroglandular type

Fever of some degree is always found in early cases of tularæmia There is often an initial rise, and after one, two, or three days a fall which lasts for a short time The temperature then ascends to about the original level and then for a period of two or three weeks gradually descends to normal. Leukocytosis is not constant, although there is usually present a slight increase.

Skin Eruption—In a few cases a definite skin eruption occurs, and in one of our cases this eruption was of a pustular character very similar to the eruption of smallpox. It may, however, be macular or papular

Recovery is slow and it is a rather constant characteristic for these patients to complain of weakness for several months

Prognosis—Recovery is the rule Seven deaths have been reported out of 253 cases, and three of these were fulminating cases of an oculoglandular type occurring in one family

Immunity—One attack confers immunity, there being no reported reinfections

Diagnosis—The important points are the history of possible contamination by infected rabbits, tick, or fly, the sudden, severe onset, inflammation of the regional lymph-glands, the primary papule or the conjunctivitis followed by the multiple ulcerative conjunctivitis, the chronicity of the glandular involvement, and the fever lasting two or three weeks

Differential Diagnosis—It has been confused with glanders, typhoid fever, influenza, septic infection, sporotrichosis, undulant fever, and tuberculosis The diagnosis made, or suspected, it should be confirmed by the agglutination test, suspected blood-serum being preserved by trikresol, or with equal parts of neutral glycerin, and forwarded to Dr Edward Francis, of the United States Public Health Service, Washington, D C The agglutinins are absent, however, during the first week of the illness They are constantly present during the second week and rise in titer during the third week, reaching a maximum in the fourth, fifth, sixth, and seventh weeks, after which there is a gradual decline but a persistence of agglutination in some degree even in long-recovered cases The serum from tularæmia cases may show a cross agglutination with abortus, the cause of contagious abortion appearing in animals, and melitensis, the cause of undulant fever.

Treatment Prophylaxis—Laboratory workers and those engaged in the handling of possibly infected animals should wear rubber gloves Thorough cooking kills the *Bacterium tularense* and consequently there should be no danger in eating an infected rabbit which has been thoroughly cooked However, experiments have shown that the deeper portions of tissue which are imperfectly cooked may contain the virulent organism There has been no vaccine or serum as yet developed which will either prevent or cure the disease In general the treatment is symptomatic and should include rest in bed and other measures as indicated. The surgical treatment of the infected glands and papule should be conservative Early incision does nothing to hasten recovery and ofttimes seems to prolong the infection. Hot, moist applications, locally, and incision only after fluctuation has approached the skin have seemed to give the best results

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THE CHANGE IN THE CLINICAL PICTURE OF SYPHILIS AS A RESULT OF AUGMENTATION OF VASCULAR AND NERVOUS SYMPTOMS AND THE CAUSE THEREOF

(FROM THE SERAFIMERLASARETTET, STOCKHOLM, SWEDEN)

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THE prognosis of syphilitic infections is a question that has always created and is still creating interest, not least on account of its great practical importance Despite revolutionizing discoveries during the last few decades concerning the bacteriology, serology and therapy of this disease, our knowledge of its prognosis is still imperfect. We are clearly better equipped than formerly when called upon to combat the contagious symptoms, but how are we placed in regard to the more serious sequelæ of the disease, the ultimate damage to nerves and vessels? Are we able to prevent these? Can we cure them?

Physicians and psychiatrists no less than neurologists and pathologists tell us not infrequently that syphilis of nerves and vessels is actually on the increase and that this is not merely apparent by the symptoms having become more prominent since the skin symptoms as a result of improved treatment became less frequent These statements are generally supported by observations and statistics which, unfortunately, cannot be disputed

Finger, the old syphilologist of Vienna, has undoubtedly given expression to the experience of many venerologists, in pointing out how great are the changes noticeable in the material in a syphilitic clinic during the last few decades While formerly the wards were full of patients presenting visible signs of primary, secondary and tertiary syphilis, most of such signs in these days cannot be observed without closer examination Syphilis of vessels and nerves has come to the foreground and has lost its character as a skin disease

Naturally, the immediate conclusion to be drawn is that this change should be ascribed to the modern syphilitic treatment and first of all, then, the arsenic preparations In that case, then, the treatment would do more harm than good That the question is not

so simple as all that is clearly evidenced by the discussion, to which these problems have given rise during the last few years

Changes in the symptomatology of chronic infectious diseases are not infrequently observed If on the whole medico-historical communications, pertaining to the conditions prevalent in the sixteenth, seventeenth and eighteenth centuries, should be considered of any value, such sources give us a great deal of information for the elucidation of this question. Although the assumption that syphilis was introduced from America to Europe by the crew of Columbus in 1493 has not been fully proved, the first syphilitic epidemic in Europe, of which we have certain knowledge, commenced at about that time

From descriptions at that time we learn that the disease occurred with violent and acute symptoms Soon after infection there was headache, arthralgia and fever, before long followed by marasmus, tertiary destructions and frequently death Already in the course of the first fifty years, however, a change for the better was noticed. Delicado in 1524 wrote that the disease began to get milder " thanks to the wood from the West Indies " Similar views were held by many doctors between 1530 and 1540 and according to the opinion of many the disease was becoming extinct and would soon be only a sad memory This optimistic view is thus of old date Unfortunately events did not turn out quite so happily, but the indisputable fact remains, however, that syphilis in Europe at the end of the sixteenth century presented a different aspect and was of a much milder nature than a hundred years earlier

How might this be explained? According to Wilmanns the following points should be considered as causative factors (1) The treatment of the disease (2) Changes in the constitution of the infected persons (3) Changes in the virus of the disease

As these factors may possibly have a bearing upon changes that have occurred at a later period in the clinical picture of syphilis, they will immediately be taken up for discussion

In regard to the treatment, as has been stated previously, this had contributed to the lessening of the ravages of the disease and this might, of course, quite possibly have been the case It should be remembered, however, that the treatment at first was either too weak or, especially in the administration of mercury, so strong, that this

mode of treatment not infrequently did more harm than it did good in cases of syphilis

That the treatment has had an influence on the course of disease in each individual case is fairly certain, but it may be doubted whether it has been able, to any large extent, to alter the character of the disease as an endemic affection Those who came under the doctor's treatment in the sixteenth, seventeenth, and eighteenth centuries were probably not many The treatment was generally begun late and was of little value The struggle between mercurialists and anti-mercurialists began quite early and continued for centuries Further, opinions varied as to whether it was wisest to commence treatment as soon as the disease had been diagnosed or wait until the symptoms had become more generalized In the latter case the idea was to let the disease "come out" and thus prevent it from settling down in internal organs The skin would, as it were, serve as a safety valve Of known syphilologists holding this view, mention may be made of Barensprung, Engel-Reimers, Kaposi and Zeissl

It is only in the latter half of the nineteenth century that we find a reversion of the ideas To commence treatment immediately after diagnosis and to continue with it periodically for some longer time, in order to prevent the symptoms from flaring up afresh, now became the leading principle of syphilitic treatment, thanks to the commanding views of such men as Fournier, Neisser, and in our country, Welander This reversion from a purely symptomatic to a prolonged intermittent treatment has been given as the cause of syphilis having changed character during the last fifty years Then again, now almost twenty years ago, the arsenical preparations were added, the powerful effect of which is too well known to need any further discussion here

There cannot be much doubt that the skin manifestations and the frequency of the disease have diminished as a result of a methodical treatment That these factors, on the other hand, should be responsible for an increase of the internal symptoms, *i e*, those referring to syphilitic changes in vessels and nerves, is less certain On this point, however, the opinions between different workers seem to be fairly divided Fraser unreservedly holds salvarsan responsible for having provoked nervous symptoms and Coenen for increase of aortitis A clinician of such wide experience as Adolf Strumpel, who has

studied these conditions in greater detail, is of the opinion that salvarsan is to be held responsible for increase of neurosyphilis In regard to syphilis of the vascular system he thinks its increase may be possibly only apparent owing to improved methods of examination, particularly by rontgenograms Wilmanns differs in this view, and very much doubts that the increase of neurosyphilis can depend upon the treatment He supports his opinion by the following argument Some syphilitic patients are careful about their treatment, others careless or do not treat themselves at all According to Lesser 10 per cent of all luetics get themselves satisfactorily treated, according to Lenz 20 per cent. In passing it may be noted here that opinions vary considerably between different authors, as to what should be meant by a thorough or satisfactory treatment. It is thus stated by Philips, quoted by Breger in a work edited by one of the German "Reichsgesundheitsamts," 1926, that three courses of treatment—evidently also Hg alone—may be reckoned as a thorough cure In this country we probably as a rule claim rather more than that from a thorough treatment According to Wilmanns, many persons from the lower classes, beggars and similar individuals more or less avoid undergoing any treatment Most cases of tertiary and other sequelæ of syphilis ought really to be found in prisons, training homes and various institutions for care of the feeble, where probably the majority of the worst treated individuals ultimately find their way Even if late syphilis would seem to be more prevalent there than in other places, the difference is not so conspicuous as it would be, were the treatment the only determining factor In the opinion of Heller and others neurosyphilis would also seem to be less frequent among the classes of lower social order and, in particular, would tabes and paralysis of the insane seem to be relatively rare

On careful analysis of the metaluetic cases it is only occasionally that any trace of passed syphilis is found in tabetic patients In the paralytic patients this is still more rare, so rare, indeed, that for a long time Fournier-Erb's theory of lues as the etiological factor in progressive paralysis was doubted for this very reason Examination of husbands and wives of patients suffering from paralysis often shows positive Wassermann, vascular and neurosyphilis but more rarely any external signs of the disease. These husband and wives as

well as cases of metasyphilis are frequently not treated The same applies not infrequently to patients in whom vascular syphilis has been found, this will be referred to again later

In short, the question as to whether the treatment is chiefly to blame for the symptoms of syphilis during the last few decades in Europe being more and more referred to vessels and nerves, has not yet been fully elucidated Arguments have been advanced both for and against

In what way can changes in the constitution of an infected person be considered to influence the clinical picture?

It is common knowledge that alcohol, tuberculosis, underfeeding and other factors predispose to a malignant form of syphilis The serious conditions prevailing in Europe in the beginning of the sixteenth century, war, privations, starvation, plague, etc., have also been held responsible for the malignancy of the disease at this period But the disease at that time brought devastation as much among the upper classes, among Borghias, worldly and spiritual rulers, living in luxury and extravagance, as among soldiers and tramps

It has further been considered possible that some spirochæte species might be more infectious than others It is only rarely, however, that any such difference is found It has often been questioned, whether "trophic syphilis" is of more serious consequences for Europeans than their own kind and arguments in both directions have been advanced. Some German Army doctors have stated that women, who were infected by Moroccans in the occupied areas by the Rhine, developed particularly severe forms of syphilis This is refuted, however, by prominent venerologists, such as Arning, who has examined the conditions more closely A belief in the greater malignancy of "tropical syphilis" is probably no longer maintained, provided it is being treated *lege artis* On the other hand, it is often found that persons infected by the same individual frequently develop symptoms of exceedingly different violence. This must be due to a different susceptibility, *i.e.*, a different constitution in the persons concerned.

If some individuals are more susceptible to syphilis than others, can it be said that similar conditions possibly apply to certain nationalities and races? In trying to probe the extensive literature, touching upon this subject, one gets the impression that it confirms,

to a certain extent, that assumption It is difficult, however, to estimate the value of particularly the older but also fairly recent literature, as the observations have frequently been made, not by doctors but by missionaries, explorers, etc Of modern works mention may be made of such by Baermann, Berkley-Hill, Nagelsbach, Gartner, Lacapère, Salomon, Plaut, Sezary, Marie and others

It is an old experience that if a people, that had previously escaped syphilis, becomes infected with it the disease will manifest itself at first violently by early and serious destructions of skin and mesodermal tissues Oviedo, a Spanish governor, thus relates such observations from Haiti as early as 1525 At about the same time Las Casas, a bishop in the West Indies, relates that the white, when infected by the natives, had very much more violent symptoms than these There is also a description from the West Indies of the conditions as they were in the latter half of the eighteenth century by a Dutch doctor, by name Samuel Jansson He relates how the natives scarcely showed any signs of the disease but that Negroes, imported as slaves from Africa, almost simultaneously fell victims to the infection. In more recent times it has been stated by the German doctor, Effertz, how the Indians in Mexico show great resistance to syphilis, scarcely any symptoms being produced, while the whites, infected by the Indians, show much more severe forms of the disease Similar reports are on hand from several other places and also from modern time

The explanation of this is supposed to be that a relative immunity has gradually been conferred on populations, among which the disease has been rampant for any length of time In Polynesia, where the disease was introduced relatively late, to wit, in the nineteenth century, it resulted in severe destructions among the native population. This question will again be referred to in a subsequent connection

This is all very well but it does not satisfactorily answer the question, why syphilis among Europeans has lost its old character in the last fifty years This change has come on too rapidly to be explained merely by an altered constitution as a result of acquired immunity through prolonged infection.

The third possibility might be found in some change in the virus Suppose there were two species of spirochætes, one of which pro-

duced symptoms in the skin and others of similar nature and another producing vascular and nervous symptoms, this could easily be verified by clinical observations The case, however, is not so simple as all that

Circumstances exist, however, that favor the assumption, as suggested by Levaditi, Nonne and others, that certain strains of spirochætes gradually became more neurotrophic than others Some animal experiments bear evidence of this It was shown by Plaut and Mulzer, through inoculation on rabbits, that one species of spirochæte produced changes in the cerebrospinal fluid in only 8 per cent of the animals, while another species produced changes in 87 per cent. Even clinical observations sometimes give evidence of this It is thus related by Moerchen that he had the opportunity in a garrison town to follow the course of disease in ten officers who had become infected by the same girl All of them later developed metasyphilis, tabes or paralysis Oscar Fischer states that women, infected by men who later developed metasyphilis, run three times as great risk of getting neurosyphilis as other infected women. Gordon, an American doctor, also believes that conjugal neurosyphilis is much more common than generally believed In the course of eight years he himself had the opportunity of seeing 32 cases

Several workers have examined the husbands and wives of paralytics and the results are in fact fairly astounding, showing the metasyphilis in these cases to be of extraordinarily frequent occurrence I will only quote an investigation by Rhoden. His material includes 140 husbands and wives (both parties being paretic) Of these, 28 per cent were free from symptoms, 72 per cent syphilitic, namely, 23 per cent. with merely positive Wassermann, 15 per cent. with anomalies of pupils and reflexes and negative Wassermann and 34 per cent with cerebrospinal syphilis

This undoubtedly supports the assumption that there exists a para-variation of the *Spirochæte pallida,* preferably attacking the nervous system. There is not much doubt that psychiatrists and neurologists are able to give evidence of similar observations

Besides the nervous system the vessels also seem to be preferably attacked in these cases It has thus been found that paralytics very often show aortic changes even if during life these have given rise to no severe symptoms So could Coppola, an Italian

pathologist, in the post-mortem examination of 176 paretics demonstrate aortitis in 86 93 per cent

This question as well as the study of the frequency of syphilitic changes in the aorta has created great interest in the last few years and been the subject of publications by a great number of authors, such as Bruhns, Gurich, Gorl and Voigt, Heller, Jungmann and Hall, Langer and others All these authors seem to be of the opinion that vascular syphilis is on the increase in an alarming degree A few figures will be given in illustration Romberg found that in his hospital material out of 1380 heart cases 15 5 per cent. were made up of syphilis of the aorta According to Leredde one-third of all deaths in heart failure are due to syphilis In his text-book on diseases of the vessels Hochhaus states that aortic insufficiency is the result of syphilis in 67 per cent of the cases It has been estimated by Lenz, on the strength of post-mortem examinations at Freiburg, that 25 per cent of all syphilitic persons sooner or later die from specific changes in the aorta This figure, however, has been criticized by Bruhns, who considers it too high This author admits, however, that aortic disease as a cause of death is very much more common than all other syphilitic sequelæ put together, even including tabes and paralysis This view is also shared by Smith, who also maintains that early deaths in syphilitic cases are due to aortitis in 78 per cent. of the cases It may be recalled that Lennmalm's investigations in Sweden showed that among persons holding life policies and who admitted syphilis when taking the insurance, the mortality was much above the average and, further, that about half the number die of nervous or vascular disease

The above figures, with the possible exception of Lenz's estimation, do not give any true idea of the percentage of all syphilitic cases contracting vascular syphilis Nor has this question been satisfactorily elucidated. Bruhns, however, has made an attempt in this direction In conjunction with an expert physician he carried out careful rontgenological examination of 200 patients, who had received specific treatment and had had syphilis for the last eight to thirty years. Approximately one-third of these proved to shown signs of aortitis

Heller's work on these questions is of great interest. He has examined the post-mortem reports from the pathological institutions

at the Charité and Moabit Hospitals in Berlin, partly for the years 1859–1870, partly 1910–1914 It was thereby found that, on estimating the percentage per number of autopsies, the cases of aortitis had increased fourfold during the last period Other statistics from other places, Leipzig, Hamburg, etc, point in the same direction, showing that aortitis has about trebled during the last fifty years And yet the treatment during this time has probably steadily increased in intensity

That this increase, however, cannot alone be explained by the treatment is shown by Jungmann and Hall in a critical examination of 110 cases of syphilitic aortitis More than half of these, namely 57 cases, had never received any specific treatment at all According to their investigation, therefore, it would seem as if the increase of vascular syphilis was about as great among treated as among untreated cases

I would now like to make some slight diversion from the course of my arguments We can clearly see how syphilis has changed its character and become more insidious in its nature Its clinical picture differs from that presented in Europe during previous centuries and is not like that prevalent among populations living in places untouched by civilization. The question naturally arises as to the conditions of vascular and neurosyphilis in Europe in olden times and what it is like now among people where the outer manifestations of the disease are in abundance?

Considering first the European conditions in old times the question of tabes is difficult to settle, because it is far from easy to diagnose this disease solely from the clinical descriptions occurring in the old literature, it being easily confused with other kinds of spinal disease, such as myelitis, multiple sclerosis, etc With regard to vascular syphilis our knowledge of this, as it occurred in olden times, is very imperfect.

Regarding paralysis, on the other hand, the position is somewhat different If a person, previously healthy in body and mind, in the prime of his life becomes the subject of psychical disturbances, dementia, paralysis and gradually dies, there is every reason for suspecting a general paralysis, more so if the person in question has had syphilis

The first authentic case of general paralysis

be the case of the Archbishop of Lyon, François Paul de Nivelle, who developed progressive mental disease as a punishment for "avoir trop aimé les femmes" and died in dementia in 1731 It was first in the nineteenth century that the disease became more commonly known

A factor, however, that must be taken into account in estimating the frequency of the symptoms of late syphilis in the past and present is the average duration of life In the middle of the eighteenth century, for example, the average duration of life in Sweden was only thirty-five years This figure has gradually improved and is now approaching fifty-eight years The conditions are probably similar in other parts of Europe, even if the figure for Sweden is at present unusually favorable As it is only in more advanced years that a great many sequelæ of syphilis became apparent, naturally, the higher the average age, the more sequelæ will be found Tabes, general paralysis, aortitis, etc, frequently give no symptoms until after the age of forty It is not easy to say to what extent the average duration of life should be allowed to affect the estimation of this question No appreciable importance, however, can be attached to it in regard to the changed symptomatology of syphilis during the last few decades

In 1922, 47,820 men were treated for mental disease in the asylums in Germany, of which 4205, or 8 8 per cent., were cases of general paralysis The corresponding figure for the cities of England is 15 per cent (Breger) According to investigations by Wiesel, general paralysis as on the increase in Sweden since 1880, and at the present time 3 2 per cent. of all syphilitic patients are afflicted with it.

These figures may suffice to show how exceedingly prevalent is the disease in Europe at the present time. Nor shall I enter any further into historical investigation of the matter We have better and more reliable knowledge of the occurrence of general paralysis and tabes in those parts of the world where syphilis is abundantly evidenced by outer manifestations

Investigations by medical men during the Great War thus showed metasyphilis to be rare among the inhabitants of Bosnia and the natives in Morocco and Algiers, although syphilis is occurring there as an endemic disease, 60 to 80 per cent of the population being

infected Tabetic optic atrophy also seems to be unusual among these people according to the reports of ophthalmological specialists Bauermann arrives at the same conclusion from his observation of 80,000 diseased persons among the natives of Java In regard to syphilis of the vascular system it is stated by Sitzen, in a work from 1914, that according to post-mortem examinations vascular changes of syphilitic nature are rare among the natives of Java but of common occurrence among Europeans residing there Two French doctors, Durop and Salle, in 1922 published two cases of aneurysm in Moroccans The clinical histories were of little interest in themselves and were only published because of the fact that aneurysms had not previously been observed in Moroccans For similar reasons Azemar and Lepinay in 1923 published a case of tabes in a Moroccan woman, stating that this disease had so far only been seen two or three times among these people and then in men

Lacapère has made a closer study of syphilis among the natives of North Africa. He states that the disease there has the character of what Fournier called "lésion secondo-tertiaire" Among 2072 luetic cases he could only find one paralytic and four tabetics He was able to show that the changes occurring in the cerebrospinal fluid during the secondary stage were the same among the natives as among Europeans In the former, however, these changes seem gradually to undergo spontaneous retrogression, so that in old cases one finds the fluid normal in the natives, which is not the case with Europeans

It should be pointed out here, however, that in recent publications a great many German as well as Turkish doctors refute the statement that tabes and general paralysis do not occur among the Osmans The same applies partly to neurosyphilis in China and North Africa This may be explained, however, by the fact that the conditions have altered in the last five years. It should also be pointed out that in Turkey, Algeria, Egypt, Java and in several other places where the population to a large extent is infected with syphilis and where tabes and general paralysis now begin to occur, this is taking place among the town population Although syphilis is common among the rural population they seem so far to have escaped metalues Among 10,000 Egyptian town-folk it is estimated that 4 1 per cent. suffer from general paralysis, while the same figure

among the rural people only amounts to 0 21 per cent (according to data collected by Marie) In the hospital in Cairo 677 cases of general paralysis have been treated during the last thirty years, out of these 449 were from the big cities, Cairo, Alexandria, Port Said and Suez

Syphilis came to Asia Minor about one hundred years ago Reliable data are at hand from these parts concerning the spread of syphilis, thanks to a German syphilologist, Von During, who settled down there about thirty years ago He tells us about the fearful ravages of syphilitic skin and bone lesions in the rural districts In a small place by the Black Sea he found 650 syphilitic people among whom there were 150 cases with destructions of nose and palate Among 85,000 luetic cases there were in the course of eight years only three tabetics, no cases of general paralysis or of optic atrophy The three tabetic cases were well-to-do persons who had frequently in the course of travelling come in contact with civilization. They had also received relatively strong mercurial treatment

Similar observations have been made in Sicily by Philippson, working as a venerologist in Palermo for the last twenty years

Experiences in the same direction are reported from Norway Bruusgaard has drawn attention to the fact that from about 1855 to about 1910 the syphilitic patients in "Rikshospitalet" in Oslo were practically given no treatment, due to C Boeck's view about the dangers of specific treatment On re-examination of the cases there were many old people, seventy to seventy-five years of age, with tertiary signs but none with either tabes or general paralysis

It would seem thus to be clear that everywhere, where syphilis retains its original character as a disease of skin, mucous membrane and bone, symptoms referring to nerves and vessels are rare and *vice versa*

Besides what has already been mentioned a great many factors have been brought forth in explanation of the disposition to metasyphilis Race, bodily constitution, hereditary disposition, physical and mental strain, alcoholism, sexual excesses, powerful insolation, climate, etc., are all factors that have been under discussion in this connection. None, however, has given any satisfactory explanation On account of the favorable effect of malaria as a therapy in paralysis, the theory has also been advanced that malaria and other fevers,

so usual in more southern countries, might have an immunizing effect in some populations Gartner considers this fairly probable It is of course possible that it may play some part, but its importance is to some extent lessened by certain factors In the mountainous districts of Abyssinia, "Africa's Switzerland," malaria and frambesia do not occur and the climate is such that fevers of any such severe nature are precluded from working havoc Nevertheless, tabes and general paralysis, according to Nagelsbach, do not occur, although syphilis is such a common occurrence that a young girl is not considered ready for marriage until infected with it Indeed, among a Kaffa race the children are even inoculated with syphilis so as not to present any inconvenient eruptions on the genitalia at the time of sexual maturity Mulder has shown that paralysis is as unusual among the natives in the malarial parts of West Indies as in parts free from that disease

Daraszkiewicz aroused a great deal of attention in 1925, by advancing the statement that syphilis does not lead to paralysis so long as the human body is not inoculated against smallpox. According to him it was not a coincidence that general paralysis began to occur more commonly at the same time as Jenner's idea of vaccination took the field To have gone through an attack of variola was said to be absolute protection against paralysis This assumption, however, has been proved incorrect Plaut, who together with Kraepelin, undertook a journey to U S A, Mexico and Cuba in order to study syphilis amongst Negroes and Indians, found, for example, Indians suffering from general paralysis but also exhibiting pock-marks Compulsory vaccination was introduced among the Negroes in Cuba in 1900 but no change as regards general paralysis has been noticed Galewsky points out that vaccination was introduced in Bosnia in 1887, nevertheless the paralysis has not increased since then Many similar proofs against the above theory have been forthcoming from different quarters and also in Sweden Daraszkiewicz's theory has been tested by Wigert and Loberg, who carried out revaccination on twenty-three cases of paralysis The result obtained was evidence against the vaccination theory

The outcome of the discussion is that metasyphilis is rare, where syphilis of skin, mucous membrane and bone is common. Syphilis with manifold manifestations is gradually being transformed into a

more insidious form under the influence of civilization. The problem, therefore, resolves itself into the question In what way does civilization influence the symptomatology of syphilis? It is fairly certain that this is effected by cooperation of the three factors we have discussed here The specific treatment, changes in the constitution of the infected persons, and a modification of the virus.

For example, in what way does the modern treatment prevent late syphilis? Many a therapeutist, especially among venerological specialists, would probably be apt to state that a syphilitic person developing vascular or nervous stigmata has had too little treatment The only way, they say, is to give strong treatment Neurologists and psychiatrists nevertheless frequently find neurosyphilis in patients who have received strong treatment and deny to some extent the preventative value of the treatment A factor that would seem to belong to the debit side of the treatment is often given, namely that in analysing the cases of tabes and paralysis in regard to previous treatment, the interval between the infection and the onset of the nervous symptoms is shorter in the treated cases than in the untreated.

These intervals are thus stated by Lauters to be In *tabes*—for untreated cases 16 1 years, for treated cases 13 3 years, in *paralysis*—for untreated cases 16 8 years, for treated cases 13 8 years.

The difference in time does not seem perhaps so great, but it will be found to exist in several similar statistics and always to the disadvantage of the treatment. In vascular syphilis, too, similar conditions seem to prevail Thus, according to Jungmann and Hall, in cases of aortitis, thoroughly treated, symptoms arose about eight years earlier than in untreated cases

On the other hand, it must be admitted that, as has already been mentioned regarding aortitis, tabes and paralysis are very often found in untreated cases This is clearly evidenced by the following figures, submitted by various workers to show the number of patients that had not received any previous anti-syphilitic treatment

Tabes	Paralysis
57 per cent. Neisser	56 4 per cent. Junius and Arndt
59 per cent. Lowirsky	68.2 per cent. Pette
62 per cent. Zechlin	80 5 per cent Kerim (from the asylum Top Taschi in Stamboul)
65 2 per cent. Pette	
87 2 per cent. Eulenburg	

It should further be recollected that nervous symptoms, except those of paralysis, and vascular syphilis, are quite frequently favorably influenced by specific treatment with Hg, Bi, KI and salvarsan In general paralysis the result is unfortunately not so good, but it should be remembered here that the classical picture of paralysis with storming symptoms and a relatively rapid progress is getting more and more rare It is thus not uncommon in these days to meet with paralytic cases of a duration of seven to eight years (this even without malarial treatment) It is stated by Toni-Schmitt-Kraepelin that among the 1852 cases of general paralysis treated at the Munich Clinic, 1905–1922, 144 had lasted more than eight years

Among the attempts in the last few years to find some biological explanation of the changes that have taken place in the symptomatology of syphilis may finally be mentioned the study of the immunizing capacity of the skin. It would seem that along this route the question might possibly be brought nearer its solution. A working hypothesis has at least been found which, as far as I can see, may supply the answer to nearly all the questions that have been discussed here

Clinical experience has taught us for ages that the prognosis in exanthematous infectious diseases, *e g*, morbilli and scarlatina, is worse if the rash is slight or even entirely absent This question has again been taken up for reinvestigation by Bruno Bloch, E Hoffmann and others This year, Cedercreutz gave before the Finnish Medical Society a summarized account of the theory of the "esophylaxia" of the skin, this term has been suggested by Hoffmann to denote the inwardly directed protective function of the skin. These workers consider the skin to be the most important organ for formation of immune bodies

The old syphilologists, in explaining that specific treatment should not be adopted until the disease had come out in full bloom, were clearly, even if unknowingly, on the same track, and modern venerologists have now, as just mentioned, taken up the immunizing capacity of the skin for discussion in connection with the syphilitic problems

Sezary, having studied in greater detail the pathogenesis in neurosyphilis in conjunction with the disease as occurring in exotic populations, has pointed out that early syphilis in Europe may be

compared with that now prevalent in uncivilized countries A florid syphilitic affection of skin and mucous membrane may occur side by side with vascular syphilis and neurosyphilis This will depend upon, in the first place, whether the infected individual, thanks to syphilitic ancestors, has acquired relative immunity He further inquires whether the subsequent development of the disease is due to some modification of the virus or the organism, the latter, in his opinion, being the most likely In secondary syphilis the cerebrospinal fluid shows the same changes in Arabs and Europeans, but only the latter develop cerebral symptoms, having in the course of centuries evolved an allergia which heals, or, at least, diminishes the skin manifestations In case this congenital allergia is absent a florid affection of skin and mucous membrane occurs at the time of infection, which in its turn leads to formation of antibodies which destroy the spirochætes in the nervous system According to this theory, therefore, the longer the syphilis has existed within a given area of population, the more frequent should be the cases of neurosyphilis The nervous system itself greatly lacks capacity for effecting immunity

The treatment of early syphilis prevents the formation of antibodies If abortion of the infection can be effected by treatment, well and good, but if this is not successful, the risk of syphilitic sequelæ is great All specific treatment in recent cases, therefore, should be exceedingly powerful The favorable effect of malarial treatment is said to be merely owing to its ability to stimulate the formation of immune bodies

In the light of this view there is some justification for C Boeck's fear of specific treatment in recent syphilis and it is easy to understand the results obtained in the untreated cases, namely, plenty of tertiary signs but absence of nervous stigmata

Besides Sezary, Gartner, Saloman and others have argued along similar lines, namely, that insufficient treatment is able to kill spirochætes in the skin but not in the less vascular nervous system Through early disappearance of the virus from the skin the formation of immune bodies is prevented It is therefore suggested by Auerbach that in patients who, as a result of treatment administered or from other reasons, show no, or only slight, changes in the skin, the formation of antibodies should be stimulated by efficient

irritation of the skin This has also been put into practice by Oelze, Hubner and others, who in addition to specific treatment give their patients an "esophylactic" course of inunction with irritating ointments, containing soft soap, silicious earth, terpentine, etc Light-baths are also used Kyrle's malarial therapy in early syphilis may perhaps also be reckoned as belonging to this class of treatments

What I have had to say may perhaps seem rather pessimistic and apt to lessen the value of specific treatment in syphilis This is, however, far from my intention, for let us remember that many severe syphilitic symptoms, formerly somewhat difficult to influence, as for example in vascular affections, can now be considerably improved, thanks to modern methods Many serious destructive lesions can be prevented and the risk of a malignant form of syphilis is eliminated It is fairly certain that in early cases we are able to abort a syphilitic infection and thus hinder its consequences The most important point, however, is that we are able, in a different way than formerly, to control the contagious symptoms and thereby have greater possibilities to stamp out this scourge It cannot be helped if during this fight some patients fall victims to vascular and nervous symptoms Salvarsan is still our most powerful weapon, but if specific treatment is to be given it must be rational and powerful Malarial treatment or other methods may perhaps gradually enable us to eliminate the dangers still attached to our therapeutic measures

THE RED CELL SEDIMENTATION REACTION IN SOME ACUTE INFECTIOUS CONDITIONS AND IN DISEASES OF THE JOINTS

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During the last several years the red cell sedimentation reaction has become rather widely used as a clinical test, as yet chiefly with regard to the prognosis of tuberculosis In 1918 Fahræus published his first observations on the sedimentation velocity of the red blood-cells, and later, after historical studies, he found that this phenomenon must be regarded as a very important factor in the history of medicine

According to Fahræus, the suspension stability of the blood is primarily dependent upon the proteins of the plasma The chief cause of an increased sedimentation rate of the erythrocytes is an increase in the globulin (and fibrinogen) content of the plasma proteins

By means of the sedimentation rate we may now obtain in a simple way, an insight into how the organism reacts in various diseases, and besides being of diagnostic value, the test will often give information as to prognosis, as well as indications for therapy It would involve too much time to include here an exhaustive description of the clinical expressions of this reaction. Reference, therefore, will only be made to a few examples of the various types of reaction

First, a few words must be said regarding the method of examination About 1 c c. of blood is aspirated into a specially constructed syringe, into which the citrate solution for preventing coagulation has previously been drawn. The blood is then drawn up into a pipette-like glass tube, which is placed vertically in a rack

After exactly one hour, and preferably also after two hours, and after twenty-four hours, the rate of sedimentation of the erythrocytes is read by means of a millimetre measure The one-hour reading is the most important The two-hour reading is of value as control, and also, in some cases, shows a more complete

sedimentation From the twenty-four-hour reading one gains information as to the cell-volume of the blood, and by comparing the one-hour reading and the twenty-four-hour reading, one may form some conclusion as to whether an anæmia is present or not. By this means a hemoglobin estimation within a 10 per cent. latitude of error is possible [1]

The technic of the test is thus quite simple and requires no more work than, for instance, a hemoglobin estimation Nevertheless accurate work is necessary to avoid purely technical errors As a normal rate I consider in men 1 to 3 mm sedimentation after one hour, in women, 4 to 7 mm. As a maximum rate in men, 4 to 7 mm , in women, 8 to 9 mm

The fluctuations are so wide that first when the rate is about 30 mm. after one hour, the reaction is considered abnormal, and in many diseases a rate above 100 mm. is the rule An increased sedimentation rate is found especially in infectious diseases and in malignant tumors, as well as in processes involving tissue destruction in general. Many infectious diseases show a very marked reaction, others influence sedimentation rate only slightly On the whole, a certain parallelism between leukocytosis and S R may be noted, although there are numerous and important exceptions

I will now demonstrate, by a few examples, the nature of the reaction in a few of the typical infectious diseases First two cases of ordinary, moderately severe, staphylococcic angina with three-day fever (nosocomial cases)

These cases are quite typical The increase in S R occurs on the second day of the disease, the maximum (about 35 mm) on the third to sixth day of illness, after the fever has already subsided, and then the rate falls but remains higher than normal for two weeks after the disappearance of fever

Next is a typical case of acute pneumonia (here, too, we are dealing with a nosocomial case), which I examined from the very beginning of the illness We had to deal with a patient suffer-

[1] For details I refer the reader to my works in the *Ergebnisse der innere Med u Kinderklinik*, vol 26, and in the *American Review of Tuberculosis*, vol 14, No 1, July, 1926, or to the instructions given out by certain makers with their instruments in Stockholm. The so-called "Westergren" instruments, supplied by one of the manufacturers of Berlin, are unfortunately not quite satisfactory

ing from a very benign, wholly stationary tuberculosis, whose S R not long since averaged 8 mm On the day of onset, the S R was not definitely increased, but on the third day it was 40 mm in the forenoon and 65 mm in the afternoon The maximum S R (123 mm.) appeared on the ninth day, about simultaneously with the fall in temperature The very high rate then subsided in about three weeks This and the previous case show the typical reaction in pure acute infections, with an S R maximum of 35 mm in the angina cases, and in pneumonia about the maximum rate of increase

Next I will show you the results in two cases of a nosocomial influenza epidemic in an orphan asylum, during this year Uncomplicated influenza has a very slight influence on the S R

The first case shows such a type of uncomplicated influenza with only a two-day fever (maximum 38 9) We see that the S R before the disease (2 mm) rose only to 4 or 5 mm , but this slight increase persisted for two weeks The white blood-corpuscle count was also taken No definite variation from the usual blood-picture could be observed, but on the other hand, a definite though slight displacement toward the left, "*à la* Arneth," of the neutrophile leukocytes—which I have indicated, contrary to the usual method (according to Schilling), by the percentage of unsegmented neutrophile cells

Another patient from the same epidemic was studied Here, too, the temperature fell on the third day of illness, but then there developed a complicating septic pneumonia (and soon afterward also empyema) which ended in death after eight days

Here a marked increase in S R was noted, but not until after the pneumonia had developed

The S R. did not attain, as is the rule in these influenzal pneumonias, any exceptionally great speed, such as is usually found in pneumonia In this case a definite, though not particularly marked, neutrophile leukocytosis developed The eosinophile cells disappeared entirely

Special attention is drawn to the very marked, early displacement of the nuclei We have here an example of malignant septic infarction The increase in S R. is marked, but not so marked as one might have expected.

From these cases one may conclude that influenza itself has only a very slight influence on the S R, whereas the deeper going complications are associated with a marked increase in S R

Before I go on to consider the nature of the reaction in the so-called "rheumatic" diseases, I will briefly discuss a series of disease conditions, in which, as a rule, a normal S R. or a very slight acceleration in rate is noted

Here belong, for instance, the majority of gastric and intestinal diseases In ulcus ventriculi or duodenal ulcer, one finds, however, not infrequently, pathologic rates usually corresponding to acute inflammatory conditions, eventually with perigastritis (In cholelithiasis there is frequently a pathological S R) In gastric cancer a completely normal S R is rare, but in biologically benign tumors such as cancer recti, a normal S R. may frequently be observed, especially during the earlier stages

It is further to be observed that endocrine disturbances do not in themselves cause an accelerated S R. The slightly pathologic rates found now and then in such patients are, in my opinion, due either to diseases causing the endocrine disturbances or to secondary processes, or complications Really pathologic rates must be attributed to complications, in a diabetic, for instance, to tuberculosis

Most organic nerve diseases show only slightly increased or normal rates Even in diseases with such definite anatomic changes as tabes dorsalis and dementia paralytica (without complications a normal S R. is here the rule) we often find normal or borderline rates

Meningitic forms of cerebrospinal lues show slight or moderately high increase of S R (It must be stated with reference to syphilis, however, that luetic aortitis as well as the gummatous lues is nearly constantly associated with a moderately high S R.)

In multiple sclerosis an increased rate may be observed during the exacerbations, whereas normal or border-line rates were observed during the remissions In epilepsy and the neuroses the S R. is normal

From the above it may be seen that a normal S R in no wise excludes organic disease, and to judge a case to be a neurosis because of a normal S R would be utterly mistaken. But nevertheless in

diagnosis of neurosis the S R test is often a special help With a pathologic S R the diagnosis of neurosis must be given very cautiously When from other reasons one is inclined to classify a condition as purely functional, a normal S R gives one a certain moral support

In the presence of an inexplicable chronic, subfebrile or labile temperature, a normal S R (in repeated tests) constitutes a most important support for the conclusion that the fever is at least predominantly of neurotic origin, while a pathologic S R would almost certainly exclude such a diagnosis

We come now to the large heterogeneous group of diseases included in the general term "rheumatic diseases" When a person suffers from pains in the back of obscure origin and shows a high S R. one can only reluctantly let him go with a diagnosis of muscular rheumatism or lumbago In such a case one has all reason to search diligently for the possible existence of metastases from prostatic carcinoma, tuberculous spondylitis, aortic aneurysm, paranephritic abscess, etc, as the so-called "muscular rheumatism" is not associated with any increase in S R Many types of neuritis are, however, associated with increased S R In typical rheumatic facial paresis, one may note fairly constantly, in the second and third weeks of the disease, a slight increase in S R (to about 10 to 15 mm.)

In polyneuritis there is also a pathologically increased S R, with sometimes very high readings

In so-called "ischias" (sciatica) we find as a rule a normal S R or border-line figures "Ischias" (sciatica) is a collective term and may have a varying etiology and pathogenesis In some types a very insignificant increase in S R may be noted (a few mm. above normal), but I am uncertain whether such a slight reaction has anything to do with the ischias (sciatica)

On the whole, one must conclude that those forms of so-called rheumatism, known as myalgias and neuralgias, show no increase in S R.

We may, moreover, even now distinguish a large group of joint diseases, in which the S R is only slightly or not at all influenced, that is in arthritis deformans (arthrosis or arthropathy deformans) and likewise osteochondritis, Perthes' disease, etc.

In contradistinction to these we have the infectious arthrites (tuberculous, luetic, gonorrhœic and purely septic) as well as finally the so-called "genuine rheumatic polyarthrites"

I will now demonstrate a few cases of acute polyarthritis, which is characterized by a very high S R

The first case represents a mild case of this affection, in a man of thirty-nine years, who had twice before had attacks of acute polyarthritis at eighteen and at twenty-eight years Between the attacks he was quite well

This time the patient had vague pains in his joints some weeks before the fever developed. In the beginning of the temperature curves, he suffered from fairly severe symptoms in the joints of his upper limbs

He was given 4 grams of acetylsalicyl per day The fever and joint symptoms disappeared almost completely on the seventh day The S R fell rapidly within one week from 103 to 32 mm and during the next five days fell to 12 mm The patient was now subjectively quite cured, but at the end of the third week, a marked painful reddening of one thumb developed, which disappeared after a few days The S R rose parallel with these symptoms, but considerably *before* the temperature At the end of the fourth week he was free of all symptoms

The second case of acute polyarthritis is that of a man of twenty-nine years, who had ten years previously suffered an attack of typical polyarthritis and had now been ill for about two weeks This case was considerably worse than the foregoing, the joints of upper and lower extremities being seriously involved. But in certain important points they showed a similarity

The typical wavy course of the S R curves is plainly visible The wave crests in the curve (in the seventh, tenth, fifteenth and nineteenth weeks) correspond in each case to an exacerbation of joint symptoms, but these crests become lower with the falling curves. In fact, through both last ascents, the patient had very marked symptoms, but during the wave depressions in the fourteenth, seventeenth and twentieth weeks, he was subjectively quite free of symptoms

In these cases, as also in the one to follow, the hemoglobin content of the blood was carefully taken

In the first case there was no anæmia, in the second a slight anæmia, but we can hardly demonstrate any parallelism between the variations in the hemoglobin and S R curves The same is true of the following cases First, that of a nosocomial case of moderately severe acute polyarthritis in a woman of twenty-five years, who was admitted this year for an *embolia arteriæ centralis retinæ* with a slight and apparently fully compensated mitralis vitium (acute polyarthritis eight years previously) This time she was taken acutely ill after seventeen days in the hospital, with fever and moderately severe typical joint symptoms

I wish especially to emphasize that the S R was markedly accelerated on the first day of illness (27 mm.) In purely acute infectious disease the acceleration of S R appears several days after the rise in temperature, but here we see an example of how in a disease of apparently acute onset, the S R is increased on the first day (On admission to the hospital the patient had a normal S R, 5 mm) The marked rise to 90 mm did not appear until after the febrile period during the first week of illness, but the subsequent fall was interrupted by a slight rise, which appeared one week before the second attack (in the fifth week of illness) Thereafter, the joint pains rapidly disappeared simultaneously with the fall in S R, but the slight rises in S R during the last five weeks of illness corresponded in each instance with definite although slight subjective joint symptoms

Finally I wish to demonstrate a case of acute rheumatic polyarthritis in which leukocyte examinations were undertaken simultaneously with the S R. determination.

I have also studied a clinically fairly severe case of acute rheumatic polyarthritis As the joint pains were continuous the patient was given a Sufrogel injection besides salicylics in the tenth week and (post or propter) the joint pains and S R. rapidly subsided.

We find here on the whole a definite parallelism between the S R and the number of neutrophile leukocytes (though a S R. corresponding to the most marked neutrophilia, on the day after Sufrogel injection, was not found) The nuclear displacement was

fairly slight during the entire period, but did not return quite to normal, whereas the S R, although not constant, was normal

We may, therefore, consider a very high S R as characteristic of acute rheumatic polyarthritis The S R often rises before the temperature The leukocyte picture is not nearly so markedly influenced as the S R The high S R may, in certain mild cases of acute polyarthritis, have a certain diagnostic significance, but its chief practical importance lies in its indication of the intensity of the disease process One may consider the disease at an end only after several repeated normal S R findings

In fever and the blood-picture we possess important aids both for the study of the pathogenesis of a disease as well as from a practical clinical viewpoint.

Another non-specific general reaction of this type is found in the S R., which, thanks to the simplicity of its estimation, its sensibility and wide applicability, has already been found of considerable use in our most important infectious disease, tuberculosis

It is my opinion that it may be of equal use in those diseases which I have discussed here, but we must not forget that the S R. test, as well as all clinical methods of examination, will give reliable results only in the hands of those who have given it thoughtful study

SOME OBSERVATIONS ON THE DEVELOPMENT OF HUMAN MOTILITY

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THE motility of higher mammals can be divided into two large groups of different movements One of them is cortical in origin and deals with the finer adjustment of isolated movements to visual, acoustic and tactile stimuli The efferent impulses for these movements leave the brain largely from the area gigantopyramidalis The other group, called "principal motility" by von Monakow, consists of coarse responses to sensory stimuli and in all these innervations, which are necessary for standing and locomotion and for the motor part of alimentation

The investigations of Freusberg, Sherrington and Magnus have shown that already the *isolated spinal cord* gives certain rather complicated responses to pain, cutaneous and proprioceptive stimuli If not only the spinal cord but also *the centres of the lower part of the brain stem* are left intact, then a general integration of tonic innervations for the whole body appears, which makes it possible to keep an animal standing on its feet However, it cannot attain the normal position spontaneously, once it has been thrown over Also in other respects such a "*decerebrate*" *preparation* is far from normal, its muscle tone is exaggerated and it has, at least in the acute stage, a predominance of tone in the anti-gravity muscles, which produces a caricature of the normal standing position Bazett and Penfield and Beritoff have shown that also rigidity in flexion may occur in long-lasting preparations Decerebrate animals possess a number of peculiar position reflexes, described as tonic neck and labyrinthine reflexes by Magnus and De Kleyn Animals, where spinal cord, brain stem and midbrain have been left intact (*thalamus animals*), have not only all the reflexes which are necessary for standing, but also those necessary for the acquisition of the normal position from every possible abnormal position, and for locomotion Thus the principal motility is performed by rabbits, cats and dogs, where the entire cortex and the basal ganglia have been removed

It is a very important question, how far the findings in laboratory animals can be transferred into human physiology There are considerable difficulties in these studies, coming from the following sources

(1) Though we can recognize all the anatomical structures in man which are found in higher mammals, there are considerable differences in the cellular composition of some of the most important midbrain nuclei in man and other animals

(2) Our motility differs very much from that of our mostly four-legged laboratory animals, and we do not know our exact phylogenetic relations to them. Certainly we must have descended from four-legged land-living animals in the beginning, but possibly our more recent ancestors were tree climbers.

(3) After every traumatization of the brain there is a temporary loss of functions, called shock (or diaschisis by von Monakow) This loss of function lasts some minutes to some hours in lower animals, some hours to some days in higher animals, in monkeys it may last weeks and months and in man even longer It leads to under-estimate the functions of the subcortical gray masses, especially in human pathophysiology

(4) A part of those functions, which are restored after a traumatization of the brain, possibly are emergency functions, the localization of which differs from the corresponding normal functions

Many different ways of approach will be necessary to overcome these difficulties

I tried to approach the study of human principal motility in learning how, according to the school of Magnus and De Kleyn, the principal motility of animals has to be examined These methods of examination were then applied to children and adults of all possible ages in the clinics of Professors Nonne, Kleinschmidt and Heinemann at Hamburg In this way it could be found that certain changes occur in the development of human motility, which shows for a certain period the well-known righting reflexes of four-legged animals, but in later stages loses and modifies these forms in favor of the unique human motility

To-day I shall limit myself to a few of the most important reflexes of this type.

THE MAGNUS-DE KLEYN NECK REFLEXES ON THE ARMS AND THE LEGS

They consist of especial postures of the arms and legs, which are evoked by the position of the head relatively to the trunk, and which last just as long as this position lasts They have a latency of a few seconds Their typical appearance is a stretching of these extremities towards which the chin is rotated and a flexion of those towards which the back of the head is rotated These reflexes disappear when the first three sensory cervical roots are cut They are present even after transection of the cord just above the I cervical root They can be regularly observed in rabbits and guinea-pigs, they appear frequently in dogs and cats, they are absent in normal monkeys and men During the first two years of life they can be found more or less frequently in human infants and they can be demonstrated much exaggerated in all animals after decerebrations

The Moro Reflex—This is a peculiarity of human babies during the first three months of life It consists of a transitory stretching and abduction of all four extremities to all kind of sudden stimuli, especially to quick passive movements of the head This can be proved easily, the reflex is very strong when the head is turned relatively to the fixed body and rather weak when the body is rotated relatively to the fixed head Other stimuli, producing this reflex, are quick passive movements of the big joints, sudden noises, tapping the abdomen Occasionally the stretching is followed by an abduction of the arms to the midline, before they go again into flexion This movement induced Moro, the discoverer of the reflex, to call it "Umklammerungsreflex." Moro thinks that it is a reminder of very strong reflexes of our tree-climbing ancestors, whose babies had to fasten themselves to the body of the mother tightly every time she made a big jump I do not know whether this explanation is quite correct The reflex in the human body is not appropriate to support the body, but then, on the other hand, our mothers do not jump from tree to tree any longer

A reflex which is similar to the Moro reflex of babies is the "*Sprungbereitschaft,*" which Magnus found in all animals, and which is also present in man "Sprungbereitschaft" means readiness to jump It consists of an outstretching of the arms and legs when the body is hanging free in the space and is suddenly moved

downwards It is a midbrain reflex, disappearing after extirpation of the labyrinths, but still present if only the otoliths are removed by centrifugation. The effect of the reflex is that the extremities act like springs, which grant a smooth landing on the ground

Next come a few reflexes, which Magnus calls "righting" reflexes because they are able to bring head and trunk into normal position in space and to the ground when the animal has been brought into an abnormal position

The *labyrinth righting reflex* keeps the head in normal position in space, or brings it into normal position, due to stimuli from the otoliths It is present in all animals and of course also in man Rademaker could destroy it in cats and in rabbits, by interruption of the rubrospinal tracts and by destructions of the red nuclei

The *neck righting reflex* has a tendency to bring the body into a position which corresponds to the position of the head Magnus examines it by keeping the animal on its back and then rotating its head It consists of a swing of the pelvis first in a direction opposite to the rotation of the head, and, unless the thorax is fixed, in a following swing which rotates the entire body after the new position of the head, so that the spine is straightened out again This reflex is still present after high decerebration and disappears only after cross-section of the pons The afferent stimuli go over the first three sensory cervical roots The reflex can be found in all mammals and also in man, at least during the first years of life As a rule it is inhibited in children above five years and in adults

The *Landau reflex* is a peculiarity of children, one to two years old, and is really a combination of the labyrinth righting reflex with some neck reflexes on trunk and extremities Children, lifted up with one hand under their trunk, face downwards, will lift up their head and reflexly also their legs, while the spine is curved concavely upwards When the head is moved down passively in this state, the whole body seems to fall together like a claspknife

The *body righting reflex on the body* brings about a normal position through deep pressure sensations in these parts, which are resting on the floor This reflex enables even animals whose labyrinths have been removed to attain a normal position Like the labyrinth righting reflex it disappears in cats and rabbits after destruction of the red nucleus, as has been demonstrated by Rademaker

In the *normal movement of standing up from the lying position* all the righting reflexes act together An accurate isolation of the single components is possible only by sensory denervations, destructions in the labyrinths and in the brain stem, as it has been done by Magnus, De Kleyn, Rademaker and their co-workers A relative isolation can be produced by especial tricks of the clinical examination, like blindfolding (to make the optic righting reflex impossible), holding the body free into the space under equal pressure on the trunk from all sides (to avoid the body righting reflexes), and holding the head fixed in side position (thus making the achievement of the labyrinth righting reflex impossible)

The most important part of the standing-up movements of man is due to the body righting reflex on the body, which, however, for certain reasons cannot be isolated as easily as in animals Therefore I shall only consider the standing-up movements as an entity

Four-legged animals stand up from the recumbent position by turning over the head, then the shoulder girdle and finally the hips Adult healthy men do not rotate their spine They sit up, in rolling their back symmetrically from the floor, and then they erect themselves on their hind legs

But these movements are a rather late acquisition. Babies cannot perform them, and when they first learn to get up at an age of a few months, the movement is like that of a cat or a dog, rolling over on all fours. Also the progression takes place by crouching or hopping on all fours At about the end of the first year babies learn to stand on their hind legs and they reach this position, as may be well shown in moving pictures, in a complicated and elaborate way During the first years of life children more or less quickly simplify the series of movements necessary to stand up from the floor, until they finally reach the symmetrical type of the normal adult.

It seems rather important to me that the tendency to rotations of the spine both in the movement of standing up as well as in the neck righting reflex disappears in men of a certain age in favor of a tendency to symmetrical flexions and extensions of the spine, which are not used very much by four-legged animals Certain changes in the profile of the trunk and in the position of arms and legs relatively to the trunk also suggest that man in his infantile development

goes through a stage similar to conditions in four-legged animals The name of *quadrupedal stage* may be adequate

All these reflexes are only a small part of the principal motility There are some more righting and position reflexes, which I did not mention, and there are some primitive motor patterns like suckling, swallowing, rotating the head towards stimuli of the mouth, grasping reflexes, which are typical for certain periods of infancy It would be very important to investigate all these reflexes on a large number of normal children One then would be able to determine the motor age of a child or a patient in a similar way as his mental age is estimated by the method of Binet-Simon. Studies of this kind give us the normal basis necessary for the examination of pathological conditions of the principal motility Combined with anatomical studies they promise a more accurate localization of principal motility in man

SUMMARY

During the development of human motility some peculiar reflexes appear and later on disappear A number of them existing during the second half of the first year of life are rather similar to reflexes of four-legged animals

POLYMUCOSITIS *

ITS DIAGNOSTIC IMPORTANCE AND ITS RELATION TO SYSTEMIC DISEASES

By J EPSTEIN, M D
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POLYMUCOSITIS is an inflammatory affection of various mucous membranes It is not an infrequent condition, but it is infrequently evaluated and correlated A persistent inflammation of any part of the mucosa may be a local manifestation of a general mucositis The mucous lining of two or more organs may be simultaneously or successively involved in the process of polymucositis

The entire alimentary canal and the gall-bladder, the oral cavity, the nasal passages and their accessory sinuses, the respiratory tract, the greater part of the genito-urinary system, some organs of special sense and the ducts of all secreting glands, are covered by mucous membrane

Those parts of the mucous lining which are directly exposed to the external world are derived from the ectoderm, those indirectly exposed are derived from the endoderm Histologically, a mucous membrane consists of a superficial layer of epithelium of varying type resting upon a basement membrane which is supported by connective tissue Blood-vessels, lymphatics, and nerve-fibrils are abundantly present in this connective tissue The mucous membrane is richly supplied with secreting glands of various shapes, sizes, and structural arrangements The glandular secretion may be mucous, serous, mixed, or of a variety of other substances, according to the physiologic functions of the secreting glands

It is evident that the total surface area that is covered by mucous membrane is quite extensive, and the organs they line are numerous and varied Histologically, chemically, and physiologically the various mucous surfaces differ according to the functions of the organs they line Under normal physiologic conditions, the mucosa is a protecting, secreting, absorbing, and eliminating structure serving many vital functions in the body

The large surface area of the mucosa, its exposed position to

* From Beth Israel Hospital

bacterial infection and various chemical and mechanical irritants, and its wide functional activities make it susceptible to physiologic disorders and pathologic changes In some cases there seems to be a congenital weakness of the mucosa which predisposes it to mucositis in later life

The pathologic changes in mucous lining inflammation vary with the organs affected In milder cases there is a hyperæmia, slight swelling, moderate desquamation of the epithelium and an increased abnormal glandular activity In the later and more chronic stages the mucous membrane is congested, œdematous, and irregularly thickened with cellular infiltration and increased connective-tissue formation Many parts are denuded of epithelium There is an infiltration of the submucosa and a dilatation of the blood-vessels and lymphatics The glands are swollen, irregular, hypertrophic with degenerative changes and copious secretions of infected material

Mucositis of the Respiratory System.—The respiratory passages with their devious channels, accessory sinuses, and numerous tubules are quite often affected by a general mucositis, giving rise to nasopharyngitis, sinusitis, otitis, laryngitis, and bronchitis The pathologic process in these diseases is primarily a mucositis extending later to the deeper structures and leading to various complications and sequelæ It is a common observation that patients affected with nasopharyngitis frequently have an associated sinusitis, otitis, and not uncommonly bronchitis Patients whose chief complaint is that of a chronic bronchitis may also have a chronic nasopharyngitis and sinusitis In any chronic ailment of the nose, throat, or bronchi the mucosa of the entire respiratory system is affected and the disease is a general and not a local one The condition may be called a respiratory polymucositis Treatment should be directed to the mucosa of the respiratory system as well as to the local mucous membrane

Mucositis of the Alimentary Canal—A primary inflammation of the mucosa of the alimentary tract is a frequent pathologic process Stomatitis, chronic gastritis, chronic enteritis, or mucous colitis is a common diagnosis A catarrhal stomatitis is frequently associated with a catarrhal gastritis and a catarrhal gastritis with a similar process along the intestinal tract. Cholecystitis may be a part of a chronic gastro-intestinal mucositis, and cholelithiasis may have its

origin in a mucositis of the gall-bladder Patients affected with chronic gastro-enteritis or mucous colitis will be found in many cases to have also a respiratory mucositis Chronic affection of the mucosa of any part of the alimentary canal is usually a manifestation of a general weakness of the mucous tissue of the entire digestive system. The pathologic process in many cases is a gastro-intestinal mucositis In treating chronic inflammatory affection of the mucosa of the mouth, stomach, gall-bladder, or intestines the broader clinical view of polymucositis will be helpful to successful therapeutics

Mucositis of the Urinary System—The mucosa of the pelvis of the kidneys, the ureters, the bladder and the urethra is not uncommonly affected by an inflammatory process In cases of pyelitis, it is not unusual to find an associated chronic intestinal mucositis, a chronic sinusitis, or a nasopharyngitis For the successful treatment of a catarrhal inflammation of the mucosa of any part of the urinary tract, the mucous lining of the entire system should receive therapeutic care

Mucositis of the Genital System—An inflammation of the lining of the vagina, uterus, and fallopian tubes is a common disorder The inflammation is usually not localized to any part of the genital organs but involves the entire system An associated mucositis of the urinary, gastro-intestinal, or respiratory passages may be present. For proper gynæcologic therapeutics, in treating any part of the genital system, the disease should be considered as a genital polymucositis

Mucositis in Children—The mucous membrane in children is more frequently affected than in adults Nasopharyngitis, tonsillitis, sinusitis, and otitis are common diseases of childhood Catarrhal laryngitis and bronchitis are frequent respiratory disorders In all cases, the mucosa is primarily affected The exposed position of the respiratory mucous membrane, the lack of resistance in juvenile mucosa, and the narrow devious passages of the respiratory tract make it susceptible to various infections Stomatitis, gastritis, and enterocolitis are not uncommon as a result of a general weakness of the gastro-intestinal mucosa Pyelitis is essentially a mucous membrane infection. Multiple mucous membrane affections in children may be properly grouped under polymucositis

Mucositis in Relation to Systemic Disorders—Multiple mucositis may readily serve as focal infections leading to systemic dis-

orders Many cases of bronchial asthma are undoubtedly due to a toxic absorption from the respiratory mucosa Myocarditis may result from chronic infective mucositis Nephritis can be traced in some cases to a focal infection starting in the mucosa Arteriosclerosis may be the result of a chronic toxic mucositis

Polymucositis as a Diagnosis—Infection of the mucous lining of various organs is a common occurrence The respiratory, gastrointestinal, and urogenital systems may be simultaneously or successively involved There is definite evidence in many cases that mucositis is not a local disorder More than one organ may be affected, leading to various complications and systemic diseases A wider aspect of its clinical manifestations and its multiple areas of infection will justify the diagnosis of polymucositis Like polyserositis, polymucositis may be considered as a clinical and pathological entity

Summary—A congenital or an acquired weakness of the general mucous membrane making it susceptible to inflammatory processes seems to be evident in a number of cases Subacute or chronic inflammations of various mucous membranes are quite common Pathologically and clinically the term "polymucositis" may be applied to multiple inflammations of the mucosa A general diagnosis of polymucositis will give a more comprehensive view of the pathologic processes and the clinical manifestations and will lead to rational treatment. The local treatment of the mucous lining of the nose, throat, sinuses, or any other part of the body is discouragingly tedious Viewed as a part of a general mucositis and proper treatment applied to the patient as well as to the local disorder, will bring better results For successful therapeutics, good nutrition, a suitable climate, hygienic care, tonic medication, and such antiseptic drugs as are eliminated by the mucous membrane will do good in the treatment of polymucositis

Medicine

INTESTINAL AMŒBIASIS AND SYPHILIS IN THE SAME PATIENT, DISCUSSION OF NEWER METHODS OF TREATMENT OF AMŒBIC DYSENTERY *

By LEWELLYS F BARKER, M D

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THE patient before you is the subject of two different protozoan infections He has, in the first place, *amœbic dysentery* due to invasion of the intestines by *Entamœba histolytica* and he has *syphilis* due to invasion of the body by *Treponema pallidum* The syphilis is at present latent, but the amœbic invasion, though only recently recognized, has undoubtedly been present for a year or more, the symptoms having undergone repeated exacerbation and remission during that time

CASE HISTORY

The patient, Robert M., an Italian spinner, thirty eight years of age, was admitted to Ward G of the University Hospital (service of Prof Pincoffs) on October 21st (some twelve days ago)

Complaint—Diarrhœa and pain in the lower abdomen

The *family history* is unimportant except that the patient and his family lived in Italy up to five years ago, when they came to America and settled in Baltimore

In his *past history*, the patient states that he was perfectly well except for childhood infections until a little over a year ago, when he began to have attacks of diarrhœa, associated with abdominal pain and tenderness and with the passage at times of blood and mucus in the stools He suffered also from headaches and loss of weight. He was under treatment several times and would improve for a period only to find the symptoms undergo exacerbation after relief of three or four months. Frequently, he would notice that after eating, he had a desire to go to stool, but on attempting to have a movement, no fæces were passed—only a little blood and mucus

About three weeks ago, he suffered his worst attack, when he averaged some twenty stools per day and became very weak Owing to the severity of this attack his physician sent him to the out patient department of this hospital He had been under treatment for syphilis since last August

* Clinic to Physicians held at the University of Maryland, November 3, 1927

About fifteen days ago he was referred to the Medical Division of the out patient department for physical examination, and here, and in the Gastro intestinal Division, it was found that, in addition to his syphilis, he had symp toms suggestive of amœbic dysentery He was therefore sent into the stationary clinic (Ward G) for thorough study

Physical examinations were made by Doctors Rockwood and Karns The findings were surprisingly negative except for tenderness in the lower abdomen (more marked on the left than on the right), an eczema like eruption on the scrotum, dental caries, pyorrhœa alveolaris and low blood pressure (95 sys tolic—55 diastolic)

Laboratory examinations, however, were more illuminating Thus examina tions of the *stools* revealed a little mucus and a little blood, though the stools in general were watery and brown On microscopic examination, several amœbæ to a lower power field were observed, many of them exhibiting active amœboid movement with formation of long pseudopodia Within a few of the amœbæ red blood-corpuscles could be seen, in one of them no less than four erythrocytes were present in the endoplasm Besides the actively motile amœbæ, many in active forms were observed No definite encysted forms were, however, seen An occasional *Trichomonas intestinalis* was observed

Examinations of the *blood* showed a slight anæmia R B C, 4,100,000, hemoglobin, 70 per cent, W B C, 8100 Differential count showed a slight polymorphonuclear increase and an eosinophilia of 7 per cent The Wassermann reaction was positive

The *urine* was negative for albumin, sugar and casts and the phthalein output was normal

On account of the history of having been treated for syphilis and because of the positive Wassermann reaction in the blood, lumbar puncture was done, but the cerebrospinal fluid was found to be entirely negative

The patient's temperature was usually subnormal, but on one or two occasions, it reached 99 5, the pulse rate varied between 70 and 100 per minute The respirations were twenty to the minute

On *rectal examination* (Dr M Edwards), the sphincter was found to be somewhat relaxed There were no hemorrhoids On proctoscopic examination, numerous small superficial pin point ulcers could be observed and smears made from the mucus revealed the presence of *Entamœba histolytica*

On *X-ray examination* (Dr H J Walton) after a barium enema, it was found that there was an absence of the normal haustra of the colon, after evacuation of the enema, there was a stringy mottled appearance due to some retention of the barium, suggestive of colitis

On *dermatological examination* (Dr Robinson) it was reported that the thickened, irritated scrotum was the site of an eczematous process

The *ophthalmologist's report* upon the eyes was negative (Dr Friedenwald)

In *summary* then, the patient has amœbic dysentery, latent syphilis, slight secondary anæmia and eosinophilia, pyorrhœa alveolaris and dental caries, arterial hypotension and scrotal eczema

Under *treatment*, the patient has improved very rapidly He was at first kept at rest in bed, on a soft, residue poor diet of 3000 calories, with a combination of rest, diet, and the barium in the enema used for röntgenoscopic

examination, the symptoms rapidly grew less On October 29th, he was placed upon an arsenical preparation (stovarsol), of which he was to chew one tablet with each of the three meals for six days Under this treatment, the vegetative forms of *Entamœba histolytica* quickly disappeared from the stools A search for encysted forms has thus far been negative

TRANSFORMATION OF CONCEPTIONS OF DYSENTERY IN OUR TIME

During the hour of this clinic, I shall dwell upon the facts concerning intestinal amœbiasis that I believe to be of the greatest importance for the general practitioner, omitting as far as possible superfluous details and considerations that are of purely theoretical rather than of practical interest.

The older physicians in this audience can remember very well, as I can myself, the birth of our knowledge of amœbic dysentery, and during the past thirty-five years, we have been able to watch that knowledge undergo an important expansion. When I came to Baltimore in 1891, it was just after Councilman and LaFleur had published their monograph on "Amœbic Dysentery" in the *Johns Hopkins Hospital Reports,* and Doctor Osler had shown, at the Medical Society, amœbæ from the intestines from cases of dysentery and from a dysenteric liver abscess I well recall that in the medical clinic and in the pathological laboratory, during the following ten years, we had frequent opportunities of studying amœbic dysentery in typical and atypical forms, with and without complications in organs other than the intestine In 1899, I had the good fortune to be in Manila, in the Philippine Islands, when Flexner and Strong were studying the epidemic outbreak of severe dysentery of bacillary origin We saw in Manila also many cases of amœbic dysentery in addition to the bacillary form of the disease Later on, in the Medical Clinic of the Johns Hopkins Hospital, Futcher made a careful statistical analysis of the cases of abscess of the liver due to amœbic invasion, and, still later, Sellards, who had done very important work upon intestinal amœbiasis, human and experimental, in Manila published the records of his work done here in association with Dr Walter Baetjer Pathological histological studies of Doctor MacCallum revealed also the presence of amœbæ in the vascular channels (blood- and lymph-vessels) in dysenteric cases

It has been interesting to watch through this period, the increase in precision in diagnostic methods that reveal the existence of amœbic

invasion Much light has been shed, too, upon the geographical distribution of the disease and upon the modes of infection. The discovery of healthy cyst-carriers marked an important step forward, and experiences in the Great War revealed a great increase in the numbers of these carriers, at least in many divisions of the army

I remember very well, too, our joy at the introduction of the emetin treatment of amœbic dysentery and our disappointment, when, later on, we found that, in some cases at least, the amœbic invasion was resistant to this drug During the past few years, many new remedies have been discovered and some of them are of really great importance, not only for the rapid cure of symptoms, but also, apparently, for the ridding, in many cases at least, of carriers of cysts

In all this work, the researches of protozoologists have been very helpful Unfortunately, even among these specialists in biology, there is still much confusion as to nomenclature and as to modes of differentiation of various amœbic forms from one another Gradually, however, the air is being cleared and it looks now as though we should soon have a satisfactory classification of the different types of pathogenic and non-pathogenic *Rhizopoda,* with clean-cut means of differentiating among them, both in their vegetative and in their encysted forms

TYPES OF INTESTINAL AMŒBIASIS AND THEIR SYMPTOMATOLOGY

The symptoms presented by the patients suffering from amœbic invasion vary greatly in different cases

The *acute form* may be well illustrated by the patient before you He came into the hospital passing from fifteen to twenty stools per day, rising through the night frequently to go to stool He had colicky pains in the abdomen, and there was tenderness on pressure in the lower abdomen. The stools were characteristic, containing blood-stained mucus, and many vegetative forms of *Entamœba histolytica.*

In the *advanced and chronic forms,* there are fewer stools, tenesmus is marked, digestion is much disturbed, and the patients become anæmic and emaciated.

In addition to these main forms, there are many *mild or latent*

forms, in which the onset is very insidious, with headaches, weakness, abdominal discomfort and alternating diarrhœa and constipation, with or without abdominal pain Many of these milder forms go entirely overlooked And, finally, we have the *cyst-carriers,* who may exhibit no symptoms whatever, though encysted forms of the amœba can be demonstrated in the stools The latter cases are, of course, very important from the standpoint of the general prophylaxis of amœbiasis.

Of the *complications* that may occur, abscess of the liver is, perhaps, the most important It occurred in 22 per cent of Futcher's series Abscess of the lung, abscess of the brain and abscess of the spleen are far less common, though they occasionally occur Perforative peritonitis and intestinal hemorrhage are other complications sometimes encountered

Among the more important of the *sequelæ* met with are (1) stenosis due to scar formation after healing of ulcers and (2) atrophy of the intestinal mucosa with development of a condition resembling sprue

The *mortality* is relatively low in cases that are recognized and promptly treated It is greatest where there are complications with liver abscess or with other infections (bacterial or protozoan)

DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS OF INTESTINAL AMŒBIASIS

The diagnosis in the acute and chronic cases that conform to the more usual type is relatively easy from the characteristic anamnesis, especially the history of frequent stools containing mucus, mixed with blood, or streaked with blood The diagnosis cannot even thus be made with entire certainty, except through demonstration of the presence of the causative parasites in the stools, or in mucus obtained from the rectum.

Even in the wholly atypical cases, which are all too little known (though they are very dangerous for the spread of the disease, particularly in military life or in institutional life), the diagnosis would much more often be made if the *possibility* of amœbiasis were only kept in mind by physicians who see these patients Every patient complaining of chronic diarrhœa, or of alternating diarrhœa and constipation, or of digestive disturbances with anæmia or neur-

asthenia, should have the stools examined for vegetative or encysted forms of amœbæ

The technic of examining stools for Entamœba histolytica, though fairly simple, requires for adequate application some training and experience. In the first place, only the fresh, warm stool should be examined, or a little mucus obtained from the rectum by means of a glass tube or a rectal tube should be looked at under the microscope while it is still perfectly fresh Not infrequently degenerated cells are taken to be amœbæ by the tyro

Again, one should never be satisfied with a single stool examination, unless the result be positive Where there is any suspicion of amœbiasis, at least six stools should be examined carefully with negative results before amœbic invasion dare be definitely ruled out Moreover, stools should be examined on several different days It should not be forgotten that, whereas the vegetative forms are most abundant in the glassy mucus that is tinged with blood, the encysted forms are, on the contrary, more likely to be found in the fæcal masses It is well to add a little salt solution or Ringer's solution to the particle examined, and to avoid pressure on placing the cover-glass over it. One should look first with a low-power lens and afterwards with the oil immersion lens

As Fischer has emphasized, the beginner takes too many things that are not amœbæ to be amœbæ, and a good rule for the beginner is never to speak of a vegetative amœba unless he sees distinct amœboid movement He will, too, do well to beware of reporting "dead" or "non-motile" amœbæ or "suspected" amœbæ, nor should he speak of "suspected" cysts or "questionable" cysts It is better to make a negative report, unless he can be absolutely sure that either a vegetative or an encysted amœba is present.

In examining for vegetative amœbæ, one may add a little neutral red stain, or a little eosin, or a little methylene blue When examining for cysts, a little Lugol's solution may be added to the salt solution, with this the cyst stains a golden yellow color, whereas the nuclei are tinged a darker brown.

For making permanent preparations, the fresh fæces may be simultaneously stained and fixed, and then imbedded in paraffin, and sections stained with borax carmine or with iron hematoxylin

In the search for cyst-carriers, the "concentration method" should be used for the discovery of the encysted forms One makes a suspension of a small portion of fæces in salt solution, shakes thoroughly, and then centrifugalizes, one may add one-eighth volume of ether to the suspension and allow to stand for five minutes in a separating funnel, after which the salt solution portion is centrifugalized for three minutes Cysts may often be discovered in this way when none would be found by ordinary methods

Recently, methods of cultivating amœbæ from the stools have been devised Though these methods are important for research work, I do not regard them as necessary for the work of the general practitioner

If vegetative amœbæ or encysted forms are found in the stools, the question at once arises, are we dealing with pathogenic forms or with non-pathogenic forms? The main pathogenic form is *Entamœba histolytica,* though other pathogenic forms occur and several non-pathogenic forms, particularly the ordinary *Entamœba coli,* may be met with in the stools For the purposes of the general practitioner, vegetative forms may be regarded as pathogenic provided one sees red blood-corpuscles inside some of them and observes active motility Similarly, for practical purposes, cysts containing four nuclei may be regarded as pathogenic forms, whereas cysts containing eight nuclei may be regarded as non-pathogenic. Though this rule does not strictly hold, it will, as I have said, suffice for ordinary practical purposes Research workers must know, of course, that there are no less than nine different species of *Rhizopoda* belonging to eight different genera, which may be found living within the human bowel, but the general practitioner will only be confused and not helped if he try to familiarize himself with all these nine different species

In the differential diagnosis, one has to rule out (1) *bacillary dysentery* (more acute process, high fever, toxic symptoms, marked tachycardia, absence of amœbæ and presence of dysentery bacilli in the stools) and (2) the *dysenteries due to Balantidium coli and to Schistosoma.*

In the chronic cases, one must differentiate amœbic forms from (3) *intestinal tuberculosis,* (4) *intestinal lues,* (5) *carcinoma of the*

intestine and (6) ordinary *mucous colitis* associated with spastic colon and colic

Some clues as to the *site* of the disease and the *extent* of involvement of the intestine can often be gained by means of rontgenograms

Ulcers in the rectum, or in the sigmoid flexure, can be actually seen on examination with the *rectosigmoidoscope* after a cleansing enema Minute openings of such ulcers were actually observed on proctoscopic examination in the patient before you And, as you have heard, the rontgenological examination of this patient made by Doctor Walton has yielded suggestive pictures.

TREATMENT OF INTESTINAL AMŒBIASIS

During the past two or three decades, the *treatment* of intestinal amœbiasis has been revolutionized Instead of the old crude treatment by *ipecac,* the administration of its main active principle, *emetin,* by the methods recommended by Rogers (after Vedder's studies) in 1910 to 1912, represented a great advance At first, it was believed that emetin was as specific and as surely efficacious in the treatment of intestinal amœbiasis as is quinine in the treatment of malaria If a half a grain of the hydrochloride of emetin (dissolved in sterile salt solution) be injected hypodermatically twice a day for from seven to ten days, vegetative forms of amœbæ, as a rule, quickly disappear from the fæces and the symptoms of dysentery rapidly vanish. Emetin given by mouth (in salol-coated pills) is also efficacious, though this method of administration is less satisfactory than by subcutaneous or intramuscular injection Unfortunately, emetin has also its shady side, inasmuch as it sometimes produces severe toxic effects Indeed, an outspoken polyneuritis with muscular pain and weakness, wrist drop and toe drop may develop from an overdose of emetin No less than twenty cases of this intoxication recorded in literature have been collected by Levy and Rowntree.

Another drawback lies in the fact that, though emetin is very efficacious in making vegetative forms disappear from the fæces, it is less efficient for the removal of encysted forms

Real progress was made by a combination of emetin with bismuth and iodine in the form of *emetin bismuth bi-iodide* If three grains

of emetin bismuth bi-iodide be given in capsule or cachet each day for twelve successive days, to a patient who is kept in bed on a liquid diet, both vegetative and encysted forms may disappear from the fæces The drug may be administered, if desired, in liquid paraffin, say three grains to half an ounce, this in turn being poured upon two or three ounces of water and swallowed

Some have recommended for attacking the cysts a combination of emetin (hypodermatically) with quinine irrigations of the intestine Others have combined emetin treatment with "bitter bush" infusion (Simaruba), with salvarsan, or with the oil of chenopodium

But since 1921, several entirely new drugs have been made use of in the treatment of intestinal amœbiasis and with very gratifying results I refer to (1) *yatren,* (2) *stovarsol,* (3) *treparsol,* and (4) *auramine* All of these remedies, recently introduced in the therapy of amœbiasis, are well described in Otto Willner's article in the October number of *Medicine*

The substance known as *yatren* contains 20 per cent of iodine in combination with oxyquinolinsulphonic acid, to which 20 per cent of sodium bicarbonate is added It is given in cachets in doses of three grams per day for ten days, the patient remaining in bed on a liquid diet The bowel may also be irrigated with dilute solutions of yatren. One drawback to the use of yatren lies in the fact that it, of itself, causes diarrhœa, but the drug seems to be very efficacious in getting rid of both vegetative and encysted forms of amœbæ.

Stovarsol, an organic compound of arsenic, is given in doses of four grains, chewed and swallowed with food, twice a day, or, in chronic cases, from seven and a half grains to fifteen grains per day may be given for a week followed by twelve grains per day, every other day, during the second and third weeks, and then four grains per day, daily, for three weeks Some like to combine stovarsol treatment with emetin treatment, giving stovarsol during the first and third weeks and emetin during the second and fourth weeks

Another arsenical that appears to be very useful in the treatment of intestinal amœbiasis is *treparsol,* which contains a little more arsenic than does stovarsol but seems to be less toxic than the latter for human beings It comes in tubes of thirty tablets, the maximum dose being four tablets per day It also may be combined with emetin

treatment if desired Flandin gives 0 25 gram of treparsol four times a day on the first four days of each week for a month or two He usually precedes the treparsol treatment by a week of emetin treatment. He reports very rapid disappearance of motile amœbæ and cysts from the stools, the results, as studied, indicated marked improvement in 80 per cent of his cases

Recently, an aniline dye known as *auramine* has been made use of to combat amœbic invasions It is best combined with emetin in the form of a dark, maroon-colored powder, which is known as *auremetine*

Willmore, since the summer of 1924, adopts, in the treatment of amœbic dysentery, the following program In *acute cases,* he gives one grain of auremetine in a soft gelatin capsule four times a day after food on alternate days for seven days, and then daily to a total of from forty to sixty grains He gives also four grains of stovarsol three times daily for seven days, on alternate days with the auremetine And he further gives on the stovarsol days a rectal injection of two drams of emetol in six drams of ether and twelve ounces of olive oil Finally, a heaping teaspoonful of bismuth is given every three hours for twenty days and after that three times a day This seems a very elaborate treatment, one would think it ought to do something!

In the *chronic cases* he gives auremetine and stovarsol on alternate days as just described and, in addition, gives the bismuth three times a day before food.

When the liver is involved, he gives one grain of emetine hydrochloride by intramuscular injection on alternate days for six days (six grains in all) instead of the emetol

Cases thus treated cleared up quickly, and the stools remained free from cysts for at least six months Tests were made on very severe and stubborn cases, many of them having passed through several dysentery centres in England

PROPHYLAXIS

In order to prevent intestinal amœbiasis, we have to prevent ingestion of the cysts The common sources are (1) polluted water and (2) polluted foods

Especially dangerous are water supplies that can be contaminated by surface water and food supplies that can be contaminated by human fæces, for example, salads and fruits from fields or gardens that have been fertilized by human excrement.

Recently, the contamination of water or food by chronic carriers, often healthy carriers, has been clearly demonstrated In military life, in the navy, and in institutions (particularly hospitals for the insane), this method of transmission by healthy carriers has not been uncommon Animals may also be cyst-carriers, in the tropics monkeys may be carriers and in temperate climates rats may be the offenders

Obviously, therefore, the methods of prophylaxis must, in general, be similar to those adopted for the prevention of the spread of typhoid fever and of cholera, namely, (1) disinfection of fæces, (2) protection from flies, (3) proper sewage disposal, (4) thorough treatment of patients manifesting the disease, (5) supervision over convalescents with control of stools, and (6) elimination of cyst-carriers

After this brief review of the subject, you will agree with me, I feel sure, that real progress has been made in the understanding of the nature of this form of parasitic invasion, in methods of recognizing the cases (particularly of the atypical cases and of the cyst-carriers), in the treatment of patients suffering from symptoms of the disease, and in methods of prophylaxis

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CHRONIC EPIDEMIC ENCEPHALITIS *

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UNTIL the year 1917 we knew of but two chronic inflammations of the cerebrospinal system, namely, cerebrospinal syphilis and disseminated sclerosis, the first being of infectious origin and the latter probably so

Since 1916–1918 we have unfortunately learned to know a third chronic infection of the nervous system Chronic epidemic encephalitis This disease, the first cases of which were noted in the present epidemic of 1916, was considered to begin with a pure acute or subacute inflammation Somewhat later it was remarked that the disease might continue in a chronic stage as had before been seen in cases of acute encephalitis, which left the well-known consequences in the form of spastic hemiplegias, often combined with syncinesis, athetosis or immobility

However, still later it has been discovered that there is a difference between the consequences of the acute encephalitis of scarlet fever, angina, morbilli, or other infectious diseases and the consequences of epidemic encephalitis The first cases are chronic defectuous conditions of the nervous system, they are stationary and do not show any progression or remissions The epidemic encephalitis, however, in a number of cases may be followed by a chronic condition which shows a tendency to progression, remission and intermissions in the same manner as seen in disseminated sclerosis and cerebrospinal syphilis It was my chief, Prof August Wimmer, who first emphasized this in his important monograph, "Chronic Epidemic Encephalitis," 1925

In the department for nervous diseases of the Kommunehospital in Copenhagen we have seen a very great number of these chronic cases of epidemic encephalitis, and I shall have the honor to present to you to-day some cases which might illustrate some of the very

* A clinical lecture delivered before the Interstate Post graduate Assembly of North America, July, 1927

varying types of this disease There are so many forms which very much resemble brain tumors, disseminated sclerosis, cerebro spinal syphilis, meningitis, and neurasthenia that the diagnosis of nervous diseases during the last years has encountered difficulties which were unknown in earlier days

The first case which I shall present is that of a young girl, twelve years of age The case shows a curious combination, as at the age of two years she suffered from a medullary disease, probably an acute poliomyelitis, which left a slight paresis of the right leg Otherwise she has been well until August, 1926, when after a cold she found she had difficulty in walking She was admitted to our department and the examination showed a marked spinal picture There was a slight reduction of power in the right arm, loss of the abdominal reflexes on the left side, some atrophy of the right hip and leg, right knee jerk and ankle jerk were absent There was no Babinski's sign She was able to walk, but with somewhat incoördinated movements, there being marked flaccidity of the right leg, less of the left one The ophthalmoscopic examination showed a slight choked disc with a swelling of 2–3 diopters

During the following days the paresis increased, especially of the left leg, and there appeared involuntary micturition She began to complain of dimness of vision Her face changed its natural aspect, it grew stiff and mask like, with an empty, dull expression, there was now a slight paresis of the left part of the face The lower limbs were completely paralyzed, absolutely flaccid and atonic, without tendon reflexes but with a marked extensor response of the toes on both sides The spinal puncture showed a pressure of 280 mm, and there was a negative Queckenstädt's sign, the pressure increasing considerably when the jugular veins were compressed The spinal fluid showed a slight increase of albumins, but apart from that it was normal

She grew dull, more and more somnolent, her sight became feeble, and there appeared a divergent squinting of the right eye Her voice became snuffing Her face was pale and absolutely immobile with a staring look. She developed a paresis of the right arm and the lower abdominal muscles The arm paresis increased, and in a short time both her arms as well as her legs were completely paralyzed with atonia and loss of all tendon reflexes, but with a marked Babinski reflex. There was now hyperæsthesia of the abdomen and the lower limbs The ophthalmoscopic examination showed a papillo œdema with a small hemorrhage in one of the retinæ

The whole appearance now showed a certain resemblance to a condition known as diffuse sarcomatosis, or, what is probably more correct, gliomatosis, of the meninges In order to confirm the diagnosis a new spinal puncture was performed The pressure was now 435 mm and the spinal fluid showed a somewhat larger increase of albumin The paresis of the upper limbs increased, a contraction of the fingers in claw position appearing Further she presented meningeal symptoms, as stiffness of the neck and tenderness to percussion on the head In October the papillo-œdema of both eyes was more pronounced, there was a beginning atrophy of the left eye and the sight was weak, the patient only being able to count fingers at a distance of two metres During the following weeks she improved, her headache and dizziness disappeared, the

knee- and ankle jerks became active, sensibility troubles diminished, and in November the ophthalmoscopic examination showed a normal disc. She began to use her hands, the power of the legs also increased, and by and by she was able to walk supported by a nurse.

In February her gait again grew worse, power in the lower extremities decreased and again there appeared a distal paresis of the legs with extinction of tendon reflexes on the left side But in March there was feeble movement in the lower limbs There was some pain in her legs During the following months her muscular power increased At present she is feeling absolutely well, only at times she complains of slight headaches and pains in her lower extremities The ophthalmoscopical examination still presents normal conditions In the lower limbs you will note a slight diffuse atrophy but power is fairly good The patellar reflexes are active, there is a double Babinski's sign. No ataxia and no loss of sensation

When considering this case we may first of all conclude that the disease must be a chronic inflammation of the cerebrospinal system There is not the hopeless progression of all the symptoms such as you will find in cases of cerebral or spinal tumor, not like distinct limitation and low progression as in the abiotrophies

But which inflammation?

As I have told you, we are familiar with three chronic inflammations of the brain and spinal cord. Two of these can be excluded There is no sign of syphilis, no information of a previous syphilis and no special biological reaction for syphilis

A disseminated sclerosis is just as unlikely Apart from the fact that the disseminated sclerosis is very rare in childhood, you must consider that you will never see a condition of somnolence and dulness with extended flaccid paralyses in cases of disseminated sclerosis

On the other hand, such a condition with somnolence and apathy is characteristic of a lot of cases of epidemic encephalitis Further, you know that in cases of this disease there will often be found an optic neuritis—a sign which is decidedly not pathognomonic of brain tumor and extended paralyses

This case is of special interest because of the medullary distribution of the paralyses

You will see in the following case that the choked disc may cause difficulties in the differential diagnosis of brain tumor

It is that of a man, twenty four years of age, who had been quite healthy until 1918 when he had "influenza" with headache, somnolence and vomitings, but no diplopia

In 1923 he suddenly became ill, with dizziness, scintillations and vomiting After this attack he was well for three years, with the exception of occasional dizziness

In February of this year he had so-called "influenza" which confined him to bed for a fortnight After that he suffered from severe headache, scintillation, tingling in the ears and dizziness He was feeling tired, had paræsthesia in the legs and sometimes palpitation The other functions were normal Examination of the patient showed some tenderness of the neck-muscles, a feeble Babinski sign on the left side, Romberg's symptom with a tendency towards falling, either backward or forward Ophthalmoscopic examination showed an optic neuritis in both eyes with a swelling of the disc of 2–3 diopters

The spinal fluid was normal, Wassermann reaction negative, otological examination presented a diminished hearing in both ears, probably caused by an affection of the labyrinths

The patient improved, and after a few months the ophthalmoscopic examination showed that the swelling of the disc had disappeared, the sight being absolutely normal, all the subjective symptoms had disappeared and there was no Romberg's sign

The optic neuritis with papillo-œdema caused a suspicion of brain tumor But also in this case the course of the disease did not denote this In cases of neoplasms of the brain, you will see slight remissions of the symptoms, but practically never all the symptoms, including the optic neuritis, disappear The fact that the patient was cured shows the disease to have been an inflammation, not a tumor

The following case was for some time suggestive of brain tumor but presented some signs characteristic of encephalitis

It is that of a student, aged twenty-one years Six years ago he had a febrile disease with headache but without somnolence or other cerebral symptoms November, 1926, he had attacks of cramps with loss of consciousness for an hour When admitted to the department he was confused and had difficulty in speaking The examination gave a double extensor response, but otherwise nothing abnormal

In the evening he had seven or eight epileptiform seizures with colonic contractions of all the extremities, especially his left arm, in which the cramps also took their beginning During the following days he was somewhat absent-minded and dazed, he reacted very little on being pricked with pins on his lower limbs There continually appeared attacks, some of which were generalized, others being limited to the left arm and after some time all appeared only in this arm and in the neck- and eye-muscles so that his head and eyes were turned to the left. After the attacks he was dazed and for some days he screamed and cried Later fits ceased, he was more somnolent, but he presented no pareses, only a Babinski's sign The spinal fluid contained 24 cells and a marked increase of albumin Wassermann reaction negative.

He cleared up, but now developed an atrophy of the muscles in his whole left lower extremity, also a slight atrophy of the left upper extremity but no conspicuous paresis Ophthalmoscopic examination showed a slight choked disc, but not so marked that it was surely pathological The visual field presented a defect of the temporal half for green X ray examination of the skull showed some dilatation of the sella turcica, otherwise nothing abnormal Later there was noticed some diminished action of the left lower facial muscles, beside the atrophy of the left leg and double extensor response A repeated lumbar puncture showed a pressure of 450 cm , the spinal fluid contained 40 cells and there was still larger increase of albumins During the following time he felt well, there was no headache or nausea, but now active myoclonic contractions of the quadriceps muscle of the left leg began to appear Electric examination showed a quantitative diminution of the faradic irritability of the muscles of the left leg, but no reaction of degeneration The condition improved and in January the ophthalmoscopic examination presented a normal disc, the visual field was now also normal He only had headache and felt dizzy a few times, and there had not been cramps since the initial attacks He now only complained of fatigue and the myoclonic jerks of his left lower limb Lately he has vomited several times, the vomiting being considered cerebral, the examination of the ventricular functions presenting a normal condition

I shall show the patient He does not present many symptoms You will see that he has an asthenic and pale face—such a pallor is very common in encephalitis Further you will see the slight muscular atrophy of the left leg, the myoclonic contractions and the double extensor response

There had for some time been some doubt whether the patient was suffering from a brain tumor or from a chronic epidemic encephalitis The flattening of the sella turcica especially pointed somewhat toward a tumor However, the course of the disease, the marked myoclonic fits and the muscular atrophies indicated that the case must be considered as an encephalitis, not as a tumor

You know that in many cases of encephalitis there is a very slight secondary inflammation of the meninges In some cases this inflammation is very marked so that the whole picture resembles a case of tuberculous meningitis I shall show such a case who was admitted to the department a month ago

The patient is a medical student, twenty one years of age He has been previously healthy, has never had influenza Ten days before his admission he had a cold with severe fatigue in all his limbs, retrobulbar headache and tenderness of the muscles Two days later he had difficulty in micturating, the next day he was not able to urinate He was now admitted to the surgical department, as it was necessary to catheterize him several times a day The objective examination showed A slight neck rigidity, a slight Kernig s sign,

very active knee jerks and a double extensor response The rest of the examination did not show anything abnormal

By the spinal puncture there was emptied 4 c.c slightly cloudy spinal fluid which contained 300 cells per cm All the cells were mononuclear, no polynuclear cells were observed

During the whole course of the disease the temperature was much increased, varying from 39° to 39 8° C He continually had headache, was somewhat somnolent and unable to urinate He was very pale, without change of color He did not present any squinting or muscular contractions of any sort. After some days there appeared a slight dimness of vision and the ophthalmoscopic examination now showed a slight choked disc with a swelling of two and three diopters Now and then there appeared some myoclonic contractions in his legs

The patient presented at this time the picture of a typical acute or subacute meningitis It seemed most probable that it was a tuberculous meningitis, because the spinal fluid contained only mononuclear cells Two things, however, were not typical of meningitis The retention of urine is very seldom seen in the early stages of tuberculous meningitis The rather acute beginning with very high temperature from the onset is also very unusual in tuberculous meningitis We considered, therefore, the possibility that it was not a tuberculous meningitis but the meningitic form of epidemic encephalitis, which ordinarily presents a picture like this, with lymphocytosis of the spinal fluid, not a leukocytosis as in the acute meningitic forms

The course of the disease later confirmed the diagnosis

The patient slowly improved The headache diminished, the temperature decreased, the neck rigidity and the Kernig's sign disappeared, and the micturition was normal After some weeks the papillo œdema disappeared

The patient now, one month after the beginning of the disease, is in very good condition His temperature has been normal for some weeks With the exception of slight headache, he is feeling absolutely well The objective examination presents a Babinski's sign on the left side, as the only sign of the past meningitis

Perhaps you have wondered that I have not as yet mentioned the Parkinson type This is somewhat for didactic reasons The parkinsonian type is a very conspicuous type, so much, that for many physicians the Parkinson cases represent the main type of chronic epidemic encephalitis This is not correct. Chronic encephalitis represents many varying types and the Parkinson type is only a certain per cent of these cases, no doubt a minority However, I will not be so paradoxical as to give a lecture on chronic epidemic encephalitis without showing a Parkinson case

It is a man forty-eight years of age Some years ago he had several attacks of so called "influenza," but none of these had the character of the lethargic encephalitis Other than this he has been absolutely healthy

In the autumn of 1926 he noticed a diminution of fine muscular sense

in the left hand and the left leg He felt a tingling in his left hand, which often grew cold and cyanotic, and the hand had a tendency to swell and to take up a certain position with reflection of the metacarpo phalangeal joints When he was walking he dragged his left heel along the floor Otherwise the functions were good and he was able to work until his admission to the hospital

On examination the following was noted The eye movements are free, but rather slow The face is mask like, the speech quick, but low and monotonous The left upper extremity presents the typical Parkinson position The shoulder is slightly abducted, the elbow flexed, the fingers extended in the interphalangeal joints but flexed in the metacarpo phalangeal joints so that the hand and the fingers together take the shape of a pyramid The muscles are somewhat rigid and the movements slow There is no tremor The left extremity presents a marked rigidity, slowness of movement and a slight diminution of power Tendon reflexes are normal, more rightly called feeble than active, and there is a marked Babinski's sign on the left The patient lies immobile in his bed the whole day but he does not complain of anything

You have seen in this case the features which constitute the type of the parkinsonism The rigidity, the bradycinesia, the oligocinesia and the characteristic positions which result from these disturbances of the cinetic system What is notable in this case is that there is no tremor This differentiates it from the true shaking palsy It is very, very seldom that you will find a so-called *paralysis agitans sine agitatione,* and even in these cases you will scarcely see such a marked hemiplegic type, also complicated with Babinski's sign, and disturbances of the vegetative system

I have exhibited some cases which have been very severe There exists, however, many cases of epidemic encephalitis which are rather slight, cases in which passing eye-muscle pareses are almost the only signs of the disease I shall show a young woman who represents one of these slight cases

She is eighteen years of age and has always been healthy except for influenza in 1918

Eight months ago she had a diplopia with some headache, but without any fever or somnolence The diplopia disappeared, but appeared again after a month, recurring several times, the last time combined with a ptosis At her admission to this department she presented a ptosis of the right eyelid, complete abduction of the left eye not being possible The right eye presented some diminishing of the upward movement The detailed neurological examination presented *a double extensor response, but apart from this nothing objectively abnormal* A special examination from the ophthalmologist showed that there was a paresis of the right superior muscle and the inferior obliquus muscle on the right side The diplopia disappeared, but recurred. The examination a month later

presented a paresis of the right inferior obliquus, still a month later of the right internal one The ptosis improved but recurred for a short time Babinski's sign disappeared after some time and now there is a slight ptosis on the right side as the only remainder of the disease Her general condition has at all times been very good

There is scarcely any doubt as to the diagnosis In no other disease than epidemic encephalitis will you see this slow and irregular migration of the process from one eye-muscle to the other In syphilis the pareses have a more intense, massive character, depending on the deep destruction of the nuclei by obliterating endarteritis And in disseminated sclerosis the virus prefers the white substance to the gray You will generally see a suffering of the coordination and synergy of the eye movements, not the slight, but distinct, pareses of the single muscles

In conclusion let me state there exists a number of types of chronic epidemic encephalitis Choreic, neurasthenic, metabolic, hysterical, amyotrophic, epileptic, etc But it would be impossible in so short a time to show you so many pages of the variegated picture-book of epidemic encephalitis I have only wished to demonstrate some of the characteristic types and to give you some of the differential diagnostic reasonings which are fundamental in this disease which has caused neurological diagnosticians so much trouble to overcome difficulties which were unknown ten years ago and some of which are not even yet surmounted

BACTERIAL HEART DISEASE *

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UNDER this term are grouped a number of forms of bacterial infection of the heart There are two varieties which present a sufficiently clear clinical picture to warrant description These are subacute bacterial heart disease and acute bacterial heart disease. Two other forms will be given brief mention.

A SUBACUTE BACTERIAL HEART DISEASE

This disease of the heart appears in the literature under many other designations, such as subacute bacterial endocarditis, subacute infective endocarditis, septic endocarditis, slow septic endocarditis, slow endocarditis, endocarditis lenta, malignant endocarditis, ulcerative endocarditis, etc. It seems desirable to replace the word endocarditis by heart disease as it prevents the tendency to limit one's consideration to the endocardium It is admitted, however, that in this infection the lesions are often mainly endocardial in location Emanuel Libman, of New York, is the outstanding student of this disease and it is doubtless due to his reports [1] that this cardiac infection is obtaining increasing recognition by American physicians Libman has popularized the term "subacute bacterial endocarditis" I have slightly modified the name for the reason given above

Etiology—In about 95 per cent of the cases the *Streptococcus viridans* is found, the influenza organism is present in the remaining 5 per cent The *S viridans* appears in the literature under a variety of names, as small streptococcus or streptococcus parvus, streptococcus gracilis, streptococcus mitior seu viridans, streptococcus der Schleimhauten, modified pneumococcus of Rosenow, streptococcus tenuens, endocarditis coccus, and streptococcus anhemolyticus

* From the Evans Memorial and Boston University School of Medicine

[1] Libman, E, and Celler, H L., "The Etiology of Subacute Infective Endocarditis," *Am J Med Sci*, vol 140, p 516, 1910 Libman, E, *Am J Med Sci*, vol 144, p 313, 1912, *Brit Med Jour.*, vol 2, p 304, 1920, *J A M A*, vol 80, p 813, 1923, *Amer Heart Jour*, vol 1, p 25, 1925

The green streptococcus grows slowly and usually does not appear in the culture media until after thirty-six to forty-eight hours The growth may be so slow that the culture plates must be observed for at least seven days before rendering a decision that the culture is negative This coccus is positive to the Gram stain

Subacute bacterial heart disease is more common in adolescents and young adults It is prone to attack hearts in which the valves have been damaged by a previous disease, usually the rheumatic type, though some cases are engrafted upon other lesions, such as those caused by congenital or syphilitic heart disease

It is held [2] by some that such lesions produce blood-vessels in the valvular endocardium and these or the persistence of vessels present during early life predispose to the lodgement of bacterial emboli and the onset of subacute bacterial heart disease

The source of the infection is often unknown The *Streptococcus viridans* may be present in a focus of infection, whether active or dormant, or in any inflammatory process in the body These foci from which the bacteria may be conveyed by the blood-stream to the heart are numerous, for instance, the tonsils and Waldeyer ring, teeth sockets and roots, thrombosed veins (lateral sinus), lung abscess, hilus of the lung, phlegmons, osteomyelitis, gall-bladder, pelvic organs, puerperal infections, and perhaps from the intestinal tract

Pathology —The pathology is similar to, but more severe than, that of rheumatic heart disease The endocardium, both valvular and mural, is preponderatingly involved The endocardial changes tend to be extensive, vegetations, sometimes of considerable size, form on the valves and in some cases a necrosis of the tissue occurs, leading to an ulceration or perforation of the valve cusps The vegetations are quite friable and form a ready source of emboli The latter are loaded with organisms and thus they act not only in a mechanical way, but also serve as foci of infection where they lodge The masses which form on the valves and adjacent endocardium are not well channelled with blood-vessels, a fact which may be of significance in understanding the failure of treatment by bacterial serum Usually the surfaces of these lesions are covered with streptococci, even in cases in which the blood-culture in life may have been

[2] Erogoff, B , *Russkaia Klinika*, Moscow, vol. 5, p 183, Feb , 1926

negative Libman, however, has reported cases that have become spontaneously bacteria-free and in which the lesions show marked or complete healing with organization

The myocardium shows essentially round cell interstitial lesions, the so-called "Bracht-Waechter bodies" These bodies are not present in all cases and are not specific They differ from the Aschoff bodies which are found only in cases of rheumatic heart disease According to most observers, the myocardium is less involved in subacute bacterial heart disease than in that of rheumatic origin

According to Clawson and Bell,[3] acute pericarditis was present in 22 5 per cent of their 80 cases of subacute bacterial heart disease and in 72 per cent. of their 18 cases of acute rheumatic heart disease Libman,[4] however, does not find pericarditis in subacute bacterial endocarditis

The spleen is enlarged and soft—the septic type of spleen The enlargement is greater than that due to passive congestion

The kidney may show a diffuse (embolic) glomerular nephritis Such lesions were found[5] in nine of 77 cases of subacute bacterial heart disease.

Parenchymatous changes of a nature which indicate the action of a toxin are found in some cases but are totally absent in others[6] This finding may be interpreted as evidence that the streptococcus sometimes produces a toxin

Symptoms and Signs—These assume a variety of clinical pictures, no clear-cut description can be presented as applicable to all cases Subject to numerous exceptions it may be said that in a general way the clinical manifestations fall into two phases, an early phase in which the symptoms and signs are chiefly those of a low-grade infection, and a late phase when the results of embolism are prominent.

Many cases begin insidiously Occasionally there is a sore throat, influenza, or a severe cold preceding, from which a satisfactory recovery has not ensued The patients feel weak, often have pain or

[3] Clawson, J B, and Bell, E T, *Arch Int Med*, vol 37, p 66, 1926

[4] Libman, E, *J A M A*, vol 80, p 12, 815, March 24, 1923

[5] Baehr, G, and Lande, H, "Glomerulonephritis as Complication of Subacute Streptococcus Endocarditis," *J A M A*, vol 75, p 789, Sept. 18, 1920

[6] Personal conversation with Dr F B Mallory, who at my request reviewed for this point the recent necropsy protocols at the Boston City Hospital

twinges in the extremities, and have occasional light chills In other cases these symptoms may have occurred without the patient being aware of any preceding acute illness The temperature is elevated, 100° to 102° being the average The picture may be unchanged for a whole month. Occasionally chills are entirely absent, but in their stead are sweats, especially at night or in the early morning In some patients for five or six months periods of intermittent fever slip in, more rarely, days with a mild elevation of temperature and, at irregular intervals, violent chills occur Energetic and work-loving natures lose their strength and take to bed

The onset of the disease is more abrupt in some patients Their complaints fall into three groups The febrile group in which chills, sweats, or fever are the prominent features, the arthritic group, in which painful and often swollen joints [7] dominate the picture, and the embolic group, in which, out of a clear sky, the sudden appearance of blindness, aphasia, hemiplegia, or acute pulmonary or abdominal symptons is the first thing that draws attention to the diseased heart

It seems best at this point to turn to the discussion of the individual features, various combinations of which may occur in patients ill with subacute bacterial heart disease

Fever—This may be continuous or intermittent, it may be absent for days or weeks at a stretch It is irregular in type, the daily range rarely exceeds 4°, with 103° for its maximum

Heart Murmurs—Those of the pre-existing heart disease are usually present, but in some cases none may be detected Changes may be noted in the murmurs present and new ones may appear according to the development of the valvular lesions. In some cases the accompanying anæmia may be a factor in the causation of the murmurs There is nothing diagnostic of the infection in any particular murmur, but their presence draws attention to the heart

Spleen.—The spleen is enlarged and is usually palpable if carefully sought for It may be palpated in about 75 per cent. of the cases [8] Enlargement of the spleen that may be detected clinically

[7] Libman's observations make the presence of these doubtful in subacute bacterial heart disease, they occur rather in acute bacterical heart disease

[8] Vaquez, H, "Diseases of the Heart," trans by Laidlaw, 1924, W B Saunders Co, Philadelphia, p 255 Blumer, G, "Subacute Bacterial Endo carditis," *Medicine*, Baltimore, vol 2, p 140, 1923

does not occur solely as a result of chronic passive congestion, palpability of the spleen requires other explanation Pain in the splenic region is often due to an infarct of the spleen, sometimes a friction rub may be detected by auscultation

Skin—In approximately half of the cases skin lesions may be detected They are embolic in nature and appear in showers, individual lesions are transient Failure to detect them is sometimes due to neglect of repeated search

Non-elevated petechiæ occur in the skin, the conjunctivæ, the fundi of the eyes, and in the mucous membranes Common locations are the base of the neck and on the sides of the fingers and toes, but a more general distribution may occur The petechiæ are intracutaneous hemorrhages averaging one to one and a half millimetres in diameter, often pale in the centre, and do not disappear on pressure Small angiomata of the skin differ in that they are slightly elevated, cherry red in color, and may blanch on pressure Larger hemorrhagic lesions are sometimes present in subacute bacterial heart disease Blumer [9] has described "splinter hemorrhages" under the nails They are linear hemorrhages beneath the nail, usually about 4 or 5 millimetres in length and several millimetres removed from the growing edge of the nail These hemorrhages closely resemble a splinter under the nail They are not common.

Osler's nodes—"ephemeral painful nodular erythema"—are another important skin finding They are generally 1 to 1 5 centimetres in diameter, red, often pale in the centre, slightly elevated, tender, and vanish in a few hours They may leave a faint brownish pigmentation for a few days They appear in crops A favorite location is on the pads of the fingers and toes Some are intracutaneous, while others, particularly the larger ones, are subcutaneous

A rarer skin sign is the "Janeway lesions" These are small hemorrhages, non-tender, and somewhat nodular They cause pink to reddish erythematous spots, or larger areas, on the palms and soles They fade rapidly and do not leave behind pigmentation They are of more frequent occurrence and larger in size in acute rather than subacute bacterial heart disease I have seen but a few imperfect examples, but have had the opportunity of seeing some of

[9] Blumer, George, "The Digital Manifestations of Subacute Bacterial Endocarditis," *Amer Heart Jour.*, vol. 1, p 3, 259, Feb, 1926

Doctor Libman's excellent water-color paintings of them Lupus erythematosus [10] has been observed occasionally in association with subacute bacterial heart disease

Clubbing of the fingers occurs in some patients, Cotton [11] found it in about 70 per cent of his cases This change in the fingers may develop rapidly during the course of the disease In adults affected by organic disease of the heart the presence of clubbing of the finger-tips is usually strong evidence of subacute bacterial heart disease It is said [12] clubbing in the early stages can be differentiated from naturally bulbous finger-tips by observing in the true clubbing a rim of fine new pinkish skin around the margin of the nail The fingers are pale rather than cyanosed, as is the rule in congenital heart disease

Blood —A secondary anæmia is usually present Sometimes this is severe enough to resemble the primary type of anæmia The platelets are abundant, and there is seldom any alteration in the coagulation or bleeding time The white cells of the blood may be increased to 20,000 or more, but in other cases may be as few as 6000 or less It is not uncommon to note a difference of many thousand in the white count within a few hours [12]

A remarkable feature is the occasional presence of large phagocytes, first described by Van Nuys [13] They are large mononuclear cells, varying in size from 10 to 81 microns [14] These phagocytes are inconstant in their presence, they may be absent in a smear taken but an hour subsequent to one in which they were abundant They are more frequent when the leukocyte count is high and after rubbing the ear or finger [15] A thick smear is more favorable for their

[10] Report of Thirty-eighth Meeting of the Association of American Physicians, *J A M A*, vol 80, p 23, 1742, June 9, 1923

[11] Cotton, T F, "Clubbed Fingers as a Sign of Subacute Infective Endocarditis," *Heart*, vol 9, No 4, p 363, Dec, 1922.

[12] Hurxthal, L M, "Clinical Observations on Subacute Bacterial Endocarditis," *Boston Med and Surg J*, vol 197, No 2, p 45, July 14, 1927

[13] Van Nuys, F, "An Extraordinary Blood," *Boston Med and Surg J*, vol 156, No 13, p 390, March 28, 1907

[14] Sampson, J J, Kerr, W J, and Simpson, M. E, "A Study of Macrophages in the Human Blood with Special Reference to Their Presence in Two Cases of Subacute Bacterial Endocarditis," *Arch Int Med*, vol 31, p 880, June, 1923

[15] Joseph, F, "Monocytosis in Malignant Endocarditis," *Deutsch med Wohnschr*, vol. 51, p 863, May 22, 1925

detection They are, perhaps, endothelial in origin Similar cells have been produced [10] experimentally by injection of colloidal dyes, lamp black, etc The presence of these macrophages is practically certain evidence of subacute bacterial heart disease, the finding of one or two large mononuclear cells [12] (lymphocytes indistinguishable from those present in normal blood) with an ingested red cell is strong evidence of the disease, and an increase in the number of large mononuclear cells is very suggestive of subacute bacterial heart disease

Facies—A peculiar palor, sometimes described as "café au lait," may be noted. Lewis [17] has emphasized that facial palor does not occur in uncomplicated aortic insufficiency, its presence indicates anæmia and is usually a strong sign of the presence of sepsis such as that due to the *Streptococcus viridans* I have been able to confirm this in quite a number of instances In the later stages of subacute bacterial heart disease the face may be markedly cachetic in appearance.

Blood-culture—Nearly all cases of subacute bacterial heart disease have a positive blood-culture—*Streptococcus viridans*—at some stage of the infection. The culture may contain the organism constantly or sporadically, or be persistently negative after a single or several positive cultures Samples of blood should be obtained several times within a twenty-four-hour period Particularly favorable times are when fresh crops of petechiæ or evidence of embolism to some organ are present, the occurrence of chills and high fever offer greater likelihood of obtaining a positive culture Nevertheless, as Libman [18] has pointed out, the culture may be negative, although in the vegetations in the heart the organisms are present in abundance The failure to obtain a positive culture is not, therefore, proof of the absence of this disease The methods of culture have been discussed by Wright.[19]

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[16] Simpson, M. E, *Jour Med Research*, vol 43, p 77, 1922

[17] Lewis, T, *Heart*, vol 11, p 151, 1924

[18] Libman, E, "The Clinical Features of Cases of Subacute Bacterial Endocarditis That Have Spontaneously Become Bacteria Free," *Am J Med Sci*, vol 146, p 634, Nov 13, 1913

[19] Wright, H D, "Bacteriology of Subacute Infective Endocarditis," *Jour Path and Bact*, vol 28, p 541, Oct., 1925

Urine—This may contain showers of red blood-corpuscles or at times may be grossly hemorrhagic Both conditions are transient and so may not be detected without persistent observation The presence of the blood-cells is due to the occurrence of renal infarcts. Epithelial casts or blood-casts and the picture of a glomerular nephritis of varying severity are found in some cases in which the bacterial emboli produce renal disease According to Libman,[20] diffuse glomerular nephritis occurs more than fifteen times as frequently in the bacteria-free stage of subacute bacterial heart disease as in the stage with bacteræmia

Embolism—In addition to the embolic skin lesions and the infarcts in the spleen and kidneys already mentioned, emboli may occur elsewhere, especially to the brain. Embolism of the central artery of the retina, followed by atrophy of the optic nerves and degenerative changes in the retina, occurs in about 2 5 per cent of the cases,[21] apparently inflammation of the uveal tract does not [20] Hemorrhages and less frequently certain white spots, known as von Roth's spots, may appear on the retina

Diagnosis—The diagnosis offers considerable difficulty The variety of clinical pictures and the occurrence of mixed or similar infections make it difficult to describe any satisfactory picture of subacute bacterial heart disease Its presence should be suspected where there is fever of protracted duration of irregular type, and associated with chills or sweats Evidence of emboli, skin lesions, palpable enlargement of the spleen, sallowness of the complexion, secondary anæmia of unknown origin, and any of the symptoms or signs described above, point to the presence of subacute bacterial heart disease A successful blood-culture is a strong confirmatory finding In general it may be said that observation of a number of the above-mentioned symptoms and signs is the surest ground on which to base a diagnosis Such adjectives as apyretic, anæmic, hemorrhagic, pseudo-malarial, painful, nervous, silent, rheumatic, psychic, cachetic, and renal have been used to designate the various forms that may be met

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[20] Libman, E, *loc cit*

[21] Blumer, G, "Subacute Bacterial Endocarditis," *Medicine*, Baltimore, vol 2, p 148, 1923

Differential Diagnosis—Many other affections may be simulated, such as acute bacterial heart disease, septicæmia, rheumatic heart disease, typhoid fever, miliary tuberculosis, primary anæmia, malaria, results of emboli, uræmia, pyelitis, diseases of the biliary tract, etc Limitations of space prevent the discussion of all of these

Acute Bacterial Heart Disease—This rarely lasts beyond six weeks, and it is very exceptional for the *S viridans* infection of the heart to be of such a short duration Involvement of the iris, ciliary body, choroid, the pericardium, and the joints of the body is evidence against subacute bacterial heart disease[4] The presence of aneurysms in the peripheral arteries is in favor of the acute type of bacterial heart disease On the whole this latter heart infection tends to be more fulminating The identification of the organism in blood-cultures, of course, usually gives decisive evidence in the differential diagnosis of acute and subacute bacterial heart disease

Septicæmia.—The presence of a septic wound, or evidence of puerperal sepsis, and the relative lack of the findings of cardiac involvement, are generally sufficient to establish the diagnosis of septicæmia in preference to subacute bacterial heart disease If the blood-cultures are positive to any other organism than the *Streptococcus viridans* or perhaps the influenza bacillus, subacute bacterial heart disease can be excluded The most difficult condition to differentiate is a septicæmia due to the green streptococcus, but which does not involve the heart These are most commonly associated with a focus of infection elsewhere in the body and tend to disappear with the disappearance of this focus The presence of a sufficient number of the symptoms and signs of subacute bacterial heart disease already described should establish that diagnosis In some instances continued observation is necessary before a conclusive opinion can be reached

Acute rheumatic fever with cardiac involvement may simulate some forms of subacute bacterial heart disease The evidence is conflicting as to whether the rheumatic and subacute bacterial types of heart disease are as distinct as many physicians believe[22] Cases of rheumatic disease in which infection by the *Streptococcus viridans* is

[22] For references and a full discussion of this point see Miller, H. R, "The Clinical Significance of Anhemolytic Streptococci (Viridans) in the Blood-Stream," *Med Clinics of N Amer*, vol 10, No 4, p 861, Jan, 1927

superimposed are met, and Libman[23] has carefully described an indeterminate group in which, even with the post-mortem findings, it was impossible to classify the affection as to whether it was of rheumatic origin or due to the *Streptococcus viridans* At the present writing it seems best to retain the two types and to admit that there are indeterminate or mixed cases If one concedes that rheumatic heart disease and subacute bacterial heart disease are not different degrees of the same process, certain differences can be mentioned Nodules about the joints and tendon sheaths occur only in the rheumatic type The same is true of typical erythema nodosum, erythema multiforme in its typical form is found only in the rheumatic infection and in some of the intermediate group, not, however, in subacute bacterial heart disease Petechiæ are not present in rheumatic heart disease, save occasionally in association with a purpuric eruption

The skin over the joints may be reddened in cases of rheumatic fever, while this event is so rare in the subacute bacterial infection that its presence in cases of the latter group should make it probable that rheumatic fever is present as a complication Diffuse glomerular nephritis does not occur in rheumatic fever Involvement of the uveal tract is rare in the true rheumatic infection and does not occur in subacute bacterial heart disease

Palpable enlargement of the spleen, Osler's nodes, and a severe anæmia, especially if the blood-smear shows large endothelial phagocytes, point to subacute bacterial rather than the rheumatic type of infection The occurrence of pericarditis is disputed in subacute bacterial heart disease and fairly common in rheumatic fever For some unknown reason auricular fibrillation is very rare in subacute bacterial heart disease, but in rheumatic involvement of the heart it is a not infrequent complication Embolism is much less frequent in rheumatic heart disease, when emboli are cast off they are from intracardiac thrombi rather than from the valve lesions Such emboli are relatively free from organisms

Typhoid fever and the miliary form of tuberculosis at times are not easily differentiated from subacute bacterial heart disease A

[23] Libman, E, "Characterization of Various Forms of Endocarditis," *J A M A*, vol 80, No 12, p 816, March 24, 1923

careful history and study of the symptoms and physical signs are essential. The laboratory findings are often the most successful means of differentiating these diseases The white blood-count may not help, as a leukopenia may occur in subacute bacterial heart disease as well as in the other two affections A positive Widal reaction, unless the patient has had a course of vaccine for prophylaxis of typhoid fever, and the finding of typhoid bacilli in the blood-culture will establish the presence of typhoid fever Examination of the sputum and spinal fluid may sometimes assist in the diagnosis of miliary tuberculosis A blood-culture positive to the *Streptococcus viridans* will prove the diagnosis of this type of infection.

Primary Anæmia—Anæmia and heart murmurs are common to both The blood findings in subacute bacterial heart disease are more those of a moderate to severe anæmia of the secondary type, the number of white corpuscles is often too high for primary anæmia, and sometimes the giant endothelial phagocytes are detected The sore tongue, achylia gastrica, etc, of primary anæmia are not found in the cardiac infection. A blood-culture containing the *Streptococcus viridans* will, of course, establish the diagnosis of that infection as opposed to primary anæmia. In my opinion, the erroneous diagnosis of primary anæmia in cases of subacute bacterial heart disease is usually due to the failure to entertain the latter affection as a possible cause of the presenting symptoms and physical findings

Prognosis—The disease progresses to a fatal termination after a duration of months—four to eighteen or even longer Death ensues as a result of (1) Exhaustion associated with severe anæmia, (2) cardiac insufficiency, and in part due to the pre-existing disease of the heart, (3) effects of emboli, and (4) uræmia, in those cases in which glomerular nephritis has appeared More often more than one of these factors contribute to the death of the patient

In some cases an early bacteræmia is followed by the absence of the streptococci from the blood, though the clinical picture of the disease continues unabated, and death ensues within a few months Occasionally the blood-cultures become sterile and the symptoms abate The patient may be able to carry on his daily occupation as though he were well, but suddenly he is struck down by the results of the infection—fever, emboli, etc In these cases, as a rule, the

patient has not really been well, but has experienced malaise, chilliness, a sensation of being "run down," etc.

Libman,[23] however, has reported six recoveries of patients with positive blood-cultures, cardiac lesions, and sufficient of the clinical findings—fever, splenic enlargement, petechiæ, tender nodes, embolisms and progressive anæmia—to establish the diagnosis beyond reasonable question He has observed at least fifty cases with the sequelæ of the disease in which there was no history of the active bacterial stage of subacute bacterial heart disease

This same keen student of subacute bacterial heart disease believes that there are many mild cases with spontaneous recovery which escape diagnosis He has collected a large number of necropsy specimens showing the cardiac lesions in all stages of healing It is probable that in the near future there will evolve a clear picture of the diagnosis and course of this cardiac infection

Treatment—There is as yet no treatment that can be held to be effective A great deal of study is being made of the *Streptococcus viridans* and it seems likely that some means may be discovered of checking the ravages of this organism. In general the therapy may be divided into general and specific

General—The patient should be at rest in bed during the febrile periods It is not conclusively proven, however, that moderate activity is harmful during afebrile intervals provided the patient has the strength to be up and about He should of course keep within his exercise tolerance and definitely avoid fatigue and exposure of any sort Good hygiene is important and reasonable exercise is usually considered part of this The evidence is not convincing that bodily exertion, of moderate sort, is detrimental to all infections It is not unreasonable to permit those who are physically able to get something more out of what is probably the last few months of life

Fresh air and nursing are important, the latter, of course, applies particularly to patients who are definitely ill The diet should be generous, the aim being to aid the patient in his fight against the infection by supplying plenty of nourishing food The food should be well selected, attention to the vitamin and mineral content should not be neglected Milk and dairy products, eggs, fresh fruits and vegetables, good quality proteins (liver, kidneys, beef, lamb, chicken,

etc) are especially valuable Symptoms should be treated as they arise All that is possible should be done to keep the patient in a cheerful frame of mind

Specific —As stated above, there is as yet no reliable therapy I have discussed this subject more fully elsewhere [24] and will give but a brief statement Specific therapy of bacterial heart disease may be divided into (1) chemotherapy, and (2) vaccine and serotherapy

Chemotherapy Cacodylate of soda in relatively large [25] and small [26] doses has been advocated Arsphenamine and allied arsenical drugs, colloidal silver, etc, have all been tried but have not proven of value Various dyes have been administered Those used are mercurochrome–220 soluble,[27] acriflavine,[28] and gentian violet [29] Churchman,[30] whose work has drawn attention to the administration of gentian violet, points out that the dye remains in the blood-stream possibly but a few seconds, this does not, however, preclude the fact that it may remain in some organs for a considerably longer time There are, it is true, some favorable reports of the use of these chemotherapeutic agents, but success has not been consistently obtained by those who later employed them One cannot overlook the possibility that the recoveries may have been of spontaneous nature, as reported by Libman [23]

Vaccine and Serotherapy To date neither of these can be said to have attained much success Debré [31] failed with an autovaccine combined with an antiserum obtained from horses immunized with

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[24] Reid, W D, "The Heart in Modern Practice," second edition, 1928, J B Lippincott Company

[25] Billings, F, "Practical Med Series," vol 1, p 224, 1921

[26] Capps, J A., "Arsenical Treatment of Chronic Infectious Endocarditis," *Am J Med Sci*, vol 165, p 40, Jan. 8, 1923

[27] Young, H H, and Hill, J H, "Treatment of Septicemia and Local Infections by Mercurochrome–220 Soluble and by Gentian Violet," *J A M A*, vol 82, p 669, March 1, 1924

[28] Spencer, H., "Effects of the Intravenous Injection of Acriflavine," *Jour Lab and Clin Med*, vol 9, p 322, Feb, 1924

[29] Major, R H, "Recovery from Subacute Infective Endocarditis Following Gentian Violet Therapy," *J A M A*, vol 84, No 4, p 278, Jan 24, 1925

[30] Churchman, J W, "Intravenous Use of Dyes," *J A M A*, vol 85, No 24, p 1849, Dec. 12, 1925

[31] Debre, R, *Rev de Med*, Paris, vol 36, p 5, Sept–Oct, 1919

the patient's own streptococci Other workers[32] familiar with the recent success in the methods of treating scarlet fever, a streptococcal disease, have applied similar treatment to subacute bacterial heart disease, but with little, if any, success A cure has been reported in one case in which scarlet fever streptococcus antitoxin[33] was administered

Transfusion with immunized blood[34] has likewise failed The organisms, it is true, have disappeared from the patient's blood for about twelve hours and then returned in large numbers[35] It is clear that the *Streptococcus viridans* is a very difficult organism to attack As mentioned above in the paragraphs on the pathology of this disease the evidence of the action of an extracellular toxin shows the latter to be inconstant. In a careful study[36] of the *Streptococcus viridans* in fourteen cases no such toxin could be detected Studies carried out by the Department of Bacteriology, Boston University School of Medicine, have likewise failed to demonstrate the presence of an extracellular toxin

Removal of the spleen has been suggested[37] and actually performed[38] in one case, but without benefit

B ACUTE BACTERIAL HEART DISEASE

This affection appears in the literature under other names, of which the most frequently used are acute bacterial endocarditis and

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[32] Marchal, G, and Jaubert, A, "Endocarditis Maligne a Evolution Lente Echec de la Therapeutique par Injections Intraveineuses de Filtrate Streptococcique," *Bull et Mém de la Soc med des Hôp de Paris*, vol 41, No 12, p 495, April 2, 1925

[33] Toogood, E S, "Scarlet Fever Antitoxin in Case of Endocarditis and Myocarditis," *Lancet*, vol 2, p 545, Sept. 11, 1926

[34] Levison, L A., "Unsuccessful Result Following Transfusion with Immunized Blood in Case of Infectious Endocarditis," *Jour Lab and Clin Med*, vol 6, No 4, p 191, Jan, 1921 Dick, G F, "Use of Antistreptococcic Whole Human Blood in Malignant Endocarditis," *J A M A*, vol 78, No 16, p 1192, April 22, 1922

[35] Personal conversation with Benjamin White, Director of the Biologic Laboratories of the Massachusetts Board of Health

[36] Kreidler, W A, "Bacteriological Studies in Endocarditis," *Jour Infect Dis*, vol. 39, p 186, 1926

[37] Munzer, E, "Slow Septic Endocarditis," *Zentrabl f in Med*, vol 41, No 16, p 282, April 17, 1920

[38] Escudero, P, and Merlo, E V, "Splenectomy in Endocarditis," *Rev de la Soc de Med Int*, Buenos Aires, vol 1, p 361, Aug, 1925, abstr in *J A M A*

——— endocarditis—the ——— representing an adjective indicating the causative organism, as "staphylococcic," "pneumococcic," etc For reasons previously given I prefer to replace the term "endocarditis" by "heart disease"

Acute bacterial heart disease is an infection of the heart by any one of a number of microorganisms. There are, it is true, certain features which depend upon the organism present, but so many of the clinical manifestations are common to all that it is satisfactory to describe them as a group under the designation of "acute bacterial heart disease"

Etiology—Some one of a variety of microorganisms is found Among these are Pneumococcus, usually type I, *Staphylococcus aureus, Staphylococcus albus, Gonococcus, Streptococcus hemolyticus, Bacillus pyocyaneous, Bacillus anthracis,* and plague bacillus It is rare to find the *Streptococcus viridans* as the infecting organism The acute form of infection is more likely to be associated with wound sepsis, puerperal infection, or to follow pneumonia, gonorrhœa, empyema, etc, but it is not uncommon for the history to be negative for the occurrence of a disease of etiologic significance

Acute bacterial heart disease attacks hearts in which the valvular endocardium has previously been damaged In most clinics the acute bacterial infection is less common than subacute bacterial heart disease

Symptoms and Signs—It is often insidious in onset, sometimes the result of emboli are the first manifestation Most of the findings already described under subacute bacterial heart disease may be observed, but the condition progresses more rapidly to a fatal termination Sometimes acute bacterial heart disease sets in with a chill After one or two days of prodromes, among which headache, fever, and a feeling of being sore all over predominate, the patient often lapses into a stupefied condition, shows high temperature, quick pulse, rapid respiration, and on the skin, mucous membranes and retina, more or less petechiæ or larger hemorrhages Miliary or larger blisters and, when staphylococcus is the invading organism, pustules may appear on the skin

The spleen is often palpable if carefully sought for In exceptional cases the Janeway lesions are present on the palms and soles These are pink to reddish, erythematous or somewhat nodular spots

or areas which are non-tender and fade rapidly without leaving any pigmentation They may be 1 to 1 5 cm in diameter

The skin over some of the joints may be reddened as in rheumatic fever, a purulent effusion may form in the joint Clubbing of the fingers is said to occur

Involvement of the uveal tract or a pan-ophthalmitis may be present. Optic neuritis or atrophy due to embolism of the central artery occurs Hemorrhages and white spots (von Roth's spots) may be found on the retina

In most cases a cardiac murmur is to be heard Occasionally the murmur has only a soft blowing character which one not uncommonly hears in other febrile diseases, but more often it is loud, rough or scraping There is nothing pathognomonic of acute bacterial heart disease in these murmurs A change in the character of previously existing murmurs or the appearance of diastolic murmurs should cause one to consider the possibility of a bacterial infection of the heart.

Pneumococcic heart disease tends to be a disease of middle life It may follow the crisis of pneumonia after a few (three to five) afebrile days The fever is high, usually a marked leukocytosis is present, and the aortic valve is prone to be attacked Death usually occurs in a few weeks—sometimes after a longer period

Staphylococcic heart disease averages a high fever and very high white count Abscesses in the organs and the more pustular form of skin lesions may appear

Gonococcal heart disease appears to be somewhat less rapid than the pneumococcic and staphylococcic types Anæmia [39] appears early, the white count is high The aortic valves are most frequently affected, lesions of the pulmonic valve are not uncommon.

Diagnosis—Chills, fever, results of emboli, etc, should suggest bacterial heart disease, especially if cardiac murmurs are present The acute form is to be suspected if the clinical manifestations are severe Detection of petechiæ, Janeway spots, and other lesions of skin, mucous membranes and retina are strong evidence of a cardiac infection.

At times a reasonable opinion can be made as to what micro-

[39] Thayer, W S, "Bacterial Endocarditis," *J A M A*, vol 82, No 21, p 1721, May 24, 1924.

organism is at work Detection of the invading bacteria in a culture of the blood will determine the particular infection and assist in establishing the presence of the disease

Differential Diagnosis—This is the same as that already given under subacute bacterial heart disease It differs from the latter in being of shorter duration and in certain details The presence of pericarditis is in favor of the acute form, Osler nodes are found only in the subacute disease Petechiæ in which the white centres are elevated occur only in the acute infection Involvement of the uveal tract, and purulent effusion into the joints may appear in acute bacterial heart disease, but not in the slower infection caused by the green-producing streptococci

Prognosis—This condition is usually fatal, however, there appear to be more instances of recovery than occur in the subacute disease Most patients succumb in a few days to weeks, a duration of more than eight to ten weeks is quite exceptional

Treatment—This is very similar to that already described as applicable to subacute bacterial heart disease, and it can also be said that it is equally uncertain in its results Mercurochrome-220 soluble and gentian violet appear to be a little more promising Some of the organisms are more suitable for the preparation of vaccines and various serums The difficulty, however, is in attacking the bacteria which are present in the interior of the masses on the endocardium

C INDETERMINATE BACTERIAL HEART DISEASE

Libman [40] has described an "atypical or indeterminate type" of bacterial heart disease These cases may occur in the entire absence of previous valvular lesions The course is subacute with fever and marked anæmia The symptoms and signs in part are in agreement with subacute bacterial heart disease and in part like those of heart disease of rheumatic origin, but various details are present which prevent a positive diagnosis of either of these conditions

For example,[41] in favor of subacute bacterial heart disease and against the rheumatic infection, there were skin lesions, petechiæ with white centres, Osler nodes (one case), emboli (apparently not derived

[40] Libman, E, *J A M A*, vol 80, No 12, p 813, March 24, 1923 Libman, E., and Sachs, B, *Arch Int Med*, vol 33, p 704, June, 1924

[41] Footnote 40, reference 2

from a thrombus in the left auricle), an enlarged spleen, generalized purpura, and an acute or subacute diffuse glomerular nephritis On the other hand, strongly pointing to rheumatic heart disease, were the severer joint disturbances, the heart-valve lesions, and the presence of acute fibrinous pericarditis

At the necropsy all four cardiac valves were found to be involved, neither Aschoff nor Bracht-Waechter bodies were discernible in the myocardium, and the vegetations on the valves were sterile The vegetations on the valves were larger than those of rheumatic type, and were softer, of irregular size, and fastened to the valve by a broad base The vegetations extended to the mural endocardium of the auricles and ventricles, or spotted the endocardium in isolated small patches The *Streptococcus viridans* was not found in blood-cultures

D TERMINAL BACTERIAL HEART DISEASE

This form of bacterial heart disease occurs without recognized symptoms or signs at the end of a chronic and debilitating disease It is found most frequently in such conditions as diabetes, nephritis, neoplasms, old lesions of the central nervous system, hyperthyroidism, and the leukæmias The lesions [42] are small verrucæ, there are no characteristic changes in the heart-muscle or in the kidneys Such verrucæ may be found in chronic rheumatic heart disease, there is a question whether they are of rheumatic origin without the presence of Aschoff bodies Libman has found these terminal lesions in the bacteria-free stage of subacute bacterial heart disease

This type of heart disease needs more study, for a true rheumatic infection of the heart may occur as a terminal event in the course of other diseases

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[42] Footnote 40, reference 1

Pædiatrics

CLINICAL TEACHING OF PÆDIATRICS AT PARIS

By P NOBECOURT, M D
Professor of the Children's Medical Clinic of the University of Paris, Paris, France

THE Children's Medical Clinic of the University of Paris is in l'Hôpital des Enfants Malades, 149 Rue de Seines It consists of a department for infants, a department for children from two to fifteen years of age, a polyclinic (general pædiatrics and syphilis), and laboratories, as well as a department for contagious diseases under the direction of the professor, who is one of the hospital doctors

Classes directed by the professor include

(1) Every morning—ward examinations of the patients with remarks of a clinical nature.

(2) On Monday and Thursday mornings—critical consultations in the polyclinic

(3) Saturday morning—a clinical demonstration of one or more patients

A complimentary course is given by the doctors associated with the clinic, including a professor, two clinical chiefs, three laboratory chiefs (chemistry, bacteriology, pathologic anatomy, etc.) and three assistants Instruction is given in medicine, therapeutics, and laboratory methods as applied in the clinic

The clinic is attended by students who have completed one semester, by graduate students, and French and foreign pædiatrists

Students and doctors who so desire may collaborate with the chiefs of the clinic in case work and thus obtain practical experience

The laboratories are open for research to doctors with references There are two official posts for foreign assistants

A social service department with one assistant is attached to the clinic.

Finally there is annexed to the clinic a school for assistants, the course being for two years

ASTHMA, TRACHEOBRONCHIAL ADENOPATHY AND TUBERCULOSIS IN CHILDREN

The coexistence in children of asthma, tracheobronchial adenopathy and tuberculosis has been recognized for a long time

Pierre Frank, H Ley (1836), Rilliet and Barthez (1863), and Therard concluded from their studies that asthma was due to compression of the pneumogastric nerve by the hypertrophied mediastinal ganglions

Likewise Williams (1873), Y Simon and Yoal (1891) speak of "ganglionic asthma," resulting from "a congestive or inflammatory lesion of the bronchial glands," from simple adenopathy, rather than from ganglionic tuberculosis On the other hand, other writers such as Descroiziller incriminate especially tuberculous adenopathy Contemporary authorities differ in their opinions

Velasco (1920) and Ribadeau-Dumas (1921) believe that asthma in children is often symptomatic of tracheobronchial tuberculous adenopathy

Others believe that ganglionic asthma, and especially asthma due to tuberculous adenopathy, is rare Thus Comby (1925), Arvid Wallgren (1925), and Péhu and Dufourt (1927) In his Paris thesis (1923), my pupil, Henri Chalot, found among the asthmatics treated in the children's clinic only 16 6 per cent had tracheobronchial adenopathy

In my personal statistics (January, 1920, to June, 1927), I found tracheobronchial adenopathy in 22 9 per cent of asthmatic children, 19 per cent in children seen in the city, and 29 per cent in hospital children.

An analysis of cases has permitted a study of the relation between asthma and tracheobronchial adenopathy

Three groups may be distinguished (1) Asthma preceding symptoms of tracheobronchial adenopathy (2) The simultaneous appearance of asthma and of tracheobronchial adenopathy (3) Tracheobronchial adenopathy preceding asthma

I. ASTHMA PRECEDING TRACHEOBRONCHIAL ADENOPATHY

In 81 8 per cent of the cases the asthma preceded the glandular symptoms In some of these cases the asthma preceded glandular symptoms by many years (five, seven and nine years)

The adenopathy, therefore, had no part in causing asthma Certainly it could not have had in the case which I reported (" Clin Méd des Enfants Affections de l'appareil respiratoire," p 318, Masson et Cie, ed. Paris, 1926) The first attack of asthma occurred at the age of five weeks Symptoms of tracheobronchial adenopathy, probably tuberculous, did not appear until he was five years old Its development did not affect the asthma

In other cases the asthma preceded the adenopathy by only a short period (one year, one and one-half and two and one-half years) It is uncertain whether in these cases a latent adenopathy may not have been the cause of the asthma

II CASES IN WHICH ASTHMA AND TRACHEOBRONCHIAL ADENOPATHY APPEARED SIMULTANEOUSLY

This occurred in 18 1 per cent. of the cases Children who were seized with an attack of asthma revealed an adenopathy which had not before been noted This type of case is very rare

Less rare are those cases in which asthmatiform phenomena appear in infants showing the first manifestations of tracheobronchial tuberculous adenopathy (Péhu and Dufourt.)

III CASES IN WHICH THE ADENOPATHY PRECEDED THE ASTHMA

My statistics contain no cases in this category Wallgren reports three such cases (children one and one-half, two, and three and one-half years of age)

Péhu and Dufourt state that they have several times observed in children from three to ten years patients with mediastinal adenopathy showing asthmatic symptoms (masked asthma)

To conclude

(1) Of one hundred children with asthma and symptoms of tracheobronchial adenopathy, 45 6 per cent had their first attack a long time before the adenopathy, 36 3 per cent had their first attack of asthma shortly before adenopathy, 18 1 per cent had their first asthmatic attack simultaneously with the first adenopathic symptoms

(2) Of one hundred children with asthma, 22 9 per cent had symptoms of tracheobronchial adenopathy, but in about one half the asthma was evidently not caused by the adenopathy

(3) Of one hundred children with asthma adenopathy seemed

probably responsible in 4 1 per cent, doubtful in 8 3 per cent and excluded as an etiologic factor in 87 5 per cent Therefore, *ganglionic* asthma is *rare!*

RÔLE OF TUBERCULOSIS IN ETIOLOGY OF ASTHMA IN CHILDREN

We have to consider *simple* tracheobronchial adenopathy and *tuberculous* tracheobronchial adenopathy This subject has been the cause of much controversy I have given two chapters to its discussion in the book on the clinic, from which I quote the following

"In my personal statistics I include only hospital asthmatics in whom the tuberculin test has been performed"

In one hundred cases of asthma I found the test positive in forty-seven cases and negative in fifty-three.

Below are some statistics on the tuberculin reaction in asthmatic children

	Tuberculin Reaction Positive %	Negative %
Alcino Ronzel (1913), Rio de Janeiro	50 0	50 0
Ruscher, in Germany (1921)	46 6	53 3
Acuña and J P Garrahan, Buenos Aires (1923)	28 8	71 1
Zerbius, Montevidio (1926)	43 9	56 0

Thus a positive tuberculin test was found in 28 to 52 per cent of cases and a negative reaction in 71 to 50 per cent

There are, therefore, a number of cases in which tuberculosis cannot be considered as a cause of asthma.

Among the tuberculin-positive asthmatics, some showed no signs of tracheobronchial adenopathy Among the tuberculin-negative asthmatics several showed signs of tracheobronchial adenopathy I found them in one quarter of my cases Ruscher found the same proportion.

A positive tuberculin reaction in an asthmatic is no proof that the tuberculosis is the cause of the asthma Many tuberculin-positive children have no clinical symptoms of tuberculosis

We may, therefore, conclude that tuberculosis plays no etiological rôle in the production of asthma

This is my opinion as expressed in the book from which the above is quoted. It is likewise the opinion of Marfan, Comby, Robert Broca (1925), Arvid Wallgren, Manerts, Acuña and Garrahan, Zerbius, Péhu and André Dufourt, etc

Sometimes, however, in about 5 per cent of cases of permanent or chronic dyspnœa of the asthmatic type, Péhu and Dufourt believe that tuberculosis does seem to play a part These cases are seen in children suffering either from cortical pleurisy (probably tuberculous) or from tracheobronchial adenopathy But quite often these latter are non-tuberculous

When, in children, asthma coexists with tracheobronchial adenopathy, one may usually discover one of the usual etiologic agents of asthma, such as Hypertrophy and chronic infection of the lymphoid tissue of the pharynx (adenoid vegetations, hypertrophy of the palatine tonsils), coryza, tracheitis, chronic tracheobronchitis, bronchopneumonia, syndrome of fetid colic, cholæmia, hypohepatica, alimentary disturbances, hypersensibility to milk, eggs, or meat, dermatoses—weeping eczema in early infancy, urticaria, prurigo, pruritus in older children, periodic vomiting with acetonuria, lymphatic and scrofulous constitution, heredity (neuro-arthritism syphilis), sometimes dust, smells, etc These factors may suffice to produce asthma quite independently of tracheobronchial adenopathy Adenopathy alone seems incapable of causing asthma.

"Medullary hyperexcitability," wrote Yoal, in his treatise on ganglionic asthma, "is the fundamental condition necessary for the production of the reflex that causes asthma This hyperexcitability of the respiratory centre is most often hereditary and is found most frequently in children of neuro-arthritic parents"

The advocates of "ganglionic asthma" believe that tracheobronchial adenopathy has some effect on the pneumogastric nerve, either by compression or by irritation.

It is undeniable that tracheobronchial adenopathy may cause pneumogastric lesions

Henri Meunier, 1896, has shown that the ganglions particularly exposed owing to their location are The juxta-tracheal ganglions, the inter-tracheobronchial ganglions (above all the right subbronchial), the peribronchial ganglions in contact with the pulmonary plexus

The right pneumogastric nerve is more exposed than the left Sometimes both are involved.

Lesions of parenchymatous neuritis or mixed neuritis of inter-

stitial origin may be noted. Severe lesions of the nerves are not necessary to bring about the trouble.

Symptoms may be caused by irritation by a hypertrophied ganglion and by periadenitis

It is of importance to ascertain the influence of the pneumogastric nerve on respiration

According to the experiments of Williams, Longet, Paul Bert, etc, after section of a pneumogastric—

(1) Stimulus of the peripheral end causes spasm of the muscles of bronchospasm, the spasm extends to the opposite side by means of the anastomosis existing between the right and left pulmonary plexuses

(2) Stimulus of the central portion causes contraction of the diaphragm by producing a reflex of the phrenic nerve

These constitute the physiologic mechanism of an asthmatic attack In reality the process is less simple, as described by Charles Richet and Charles Richet, Jr Stimulus of the peripheral end causes only a slight contraction of the bronchial muscles

Stimulus of the central portion causes cessation of respiration, now of inspiration, now of expiration. The diaphragm seems paralyzed

"This reflex paralysis of the diaphragm may be looked upon as a phenomenon of inhibition."

If the stimulus is very strong the arrest of respiration may prove fatal, by generalization of the inhibition through the medulla

Section of a single pneumogastric has almost no effect on the respiration, causing only a temporary showing

After section of two pneumogastric nerves "respiration is deeper and less frequent" Inspiration is long, jerky, irregular—expiration rapid and shorter than inspiration.

Thus physiology does not prove that irritation or compression of the pneumogastric nerve by hypertrophied mediastinal ganglion would suffice to produce an attack of asthma The possible rôle of the sympathetic must not be forgotten Stimulus of the sympathetic causes bronchial dilatation and therefore inhibition of the sympathetic would cause a broncho-constricting action of the pneumogastric.

When the tracheobronchial adenopathy is tuberculous, it has been

suggested that anaphylactic shock from the tubercular toxin may be the cause of the asthma

Velasco, who has very rarely observed lesions of the pneumogastric nerve in asthmatic cases, believes in the anaphylactic origin of asthma from tubercular toxins The theory of tubercular anaphylaxis, upheld by Landouzy, is no longer recognized Bezancon and De Jong disproved this theory

When the tracheobronchial adenopathy is not tubercular, there may be an anaphylactic reaction to the ordinary germs of the respiratory tract This is possible but has never been proved

In any case, if such an origin could be proved, the rôle of adenopathy becomes secondary, infection of the mucosæ of the nose, pharynx, the laryngotracheobronchial tract occupies a much more important place

CONCLUSIONS

(1) Asthma and tracheobronchial adenopathy are rarely associated.

(2) Tuberculosis is not a cause of asthma in children When an asthmatic suffers from tracheobronchial adenopathy, the latter is usually non-tubercular

(3) It has not been demonstrated by physiological experiments that asthma can be caused by the action of tracheobronchial adenopathy involving especially the vagosympathetic system

(4) It may be that irritation of the pneumogastric and sympathetic by hypertrophied mediastinal ganglions may contribute to the state of hypervagotonia frequently observed in asthmatics

WORK AT THE SACHSKA CHILDREN'S HOSPITAL AT STOCKHOLM *

By HAROLD ERNBERG, M D

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ONE of the ambitions of the institution is to combat, as far as possible, the spread of nasopharyngeal infections among the patients

On admission new patients are placed in small rooms The hospital does not have the cubicle system but is supplied with movable screens in the larger wards where most needed

Visiting hours are limited to twice a week and visitors are permitted only in exceptional cases to enter the ward, but may see their children through a window in the door

The nurses, as a rule, wear a nose and mouth protector while working

Every year a course in infant care, with lectures and demonstrations, is given for the benefit of prospective midwives and a couple of courses for midwives generally These courses are not compulsory for midwives in Sweden. Experience at this hospital has demonstrated that midwives are in great need of such instruction and the new laws were wholly due to the initiative of this hospital

(1) THE SIGNIFICANCE OF NASOPHARYNGEAL INFECTION IN INFANCY

Both as hospital physician and in private practice I have been much interested and absorbed in the study of nasopharyngeal infection in infancy and its effect on the organism.

I have been more and more convinced that this form of infection in infancy is responsible for various diseases. A clearer insight into these conditions is of importance for the proper understanding of certain problems in the history of pædiatrics More important is the light they throw on certain clinical syndromes and diseases of

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* The Sachska Children's Hospital was built by donated funds but is owned and run by the city of Stockholm The hospital was especially intended for infants, but when room is available admits older children as well The hospital has sixty beds Eight of these are reserved for nursing infants (eight wet-nurses are available) and six for nursing mothers The hospital was completed in 1911 The services of nurses in the course of training are made use of

infancy and their place in propaganda for hygiene and care in childhood

I was, therefore, encouraged to present my observations as being of possible interest.

In a contribution, published in Swedish only, some years ago (1907), I drew attention to the fact that the incidence of disease in a large institution, the Public Orphanage, seemed markedly related to the epidemics of nasopharyngeal infection that attacked the institution especially during the colder months of the year It was demonstrated that the increased morbidity during the winter months was due not only to increased numbers of cases of pneumonia, bronchitis, and other diseases manifestly and evidently due to nasopharyngeal infection, but also to more cases of dyspepsia, general debility of uncertain cause, etc It has from several quarters been emphasized that these periods of increased morbidity in homes or hospitals for infants are dependent chiefly on nasopharyngeal infection All pædiatricians agree that pharyngitis may cause a dyspepsia But in my opinion this point has not been stressed nearly enough nor the frequency of such a relationship realized

This problem has interested us in this hospital for many years In the first place a most painstaking anamnesis is obtained as to the possible existence of coryza, a cold, or influenza, in the infant itself or in the family preceding a dyspepsia or septicæmia

To get an exact anamnesis is a matter that requires both practice and experience Great weight is also attached to the most thorough examination of the nose and throat of the patient

My observations have convinced me that in the great majority of cases of dyspepsia and septic disease in infancy, both acute and chronic, the etiological agent may be sought in nasopharyngeal infection. In a great number of cholera infantum cases, the same holds true Acute nasopharyngitis plays this same dominating part in private as well as hospital cases

I expect shortly to publish a study of this subject in English in the *Acta Pediatrica* In the present communication I wish to make a report on the cases of acute dyspepsia, septicæmia and cholera infantum in bottle-fed infants admitted for several years into this hospital I concluded that in more than 90 per cent. of the dyspepsia cases and more than 70 per cent. of the septicæmia and cholera

infantum cases an acute nasopharyngitis was the etiologic factor There is no doubt that these figures are, if anything, too low, especially in the first two types of cases

It is not only in definite disease pictures of this type that this etiology predominates but also in the so-called nutritive disturbances

The reason that the frequency of this relationship has not been noted is due to several circumstances

I will explain one or two In cases in which exsiccation plays a prominent part in the disease picture, as for instance in severe cases of dyspepsia, a few cases of sepsis and especially in cholera infantum, the mucous membrane of the pharynx has a peculiar appearance It is dry and shiny When fluids are administered by subcutaneous saline injections and exsiccation is diminished, the mucous membrane takes on a quite different aspect It is swollen and red and shows marked symptoms of an acute pharyngitis, which existed during the stage of exsiccation but was, so to speak, masked

In a number of other cases acute pharyngitis or recently past acute pharyngitis may be diagnosed from enlarged and sometimes even tender lymphatic glands in the neck A superficial examination would not reveal these neck symptoms Often these glands are covered by the upper portion of the sternocleidomastoid muscle and may be discovered only by palpation with the child's head bent forward to relax these muscles The greatest difficulty is in deciding whether the pharyngitis has been acute By comparing history and physical findings one usually arrives at some fairly definite conclusion. It would take too much space to go into further detail regarding methods of examination, etc

The fact that acute pharyngeal infection forms an important link in the chain of pathogenesis of the majority of cases of dyspepsia and of many other diseases is of great importance and interest.

One may thus understand without difficulty how in the past, severe epidemics of various diseases occurred in the homes and hospitals for infants, with undue mortality In these days such epidemics were indeed a puzzle In modern institutions attention is given to these possibilities of infection and an attempt made to prevent them.

The matter is even of practical and clinical importance If the relationship of pharyngeal infection to various dyspeptic diseases is

taken into consideration the course in the respective cases becomes quite otherwise clear than hitherto

Take for instance a 6–7 months' bottle baby, fed in the usual manner Without any change in diet the child is suddenly seized with vomiting and diarrhœa—a puzzle to both mother and physician It is suggested that in some way or other the food has been unsuitable and the diet is changed, often without the desired result More careful analysis of the case will perhaps reveal that the mother a few days previously took cold and that the baby likewise had a naso-pharyngeal infection In this way the whole course may be explained

Again an artificially fed infant suddenly develops spasms The mother has carefully followed her physician's rules regarding diet and attributes the trouble, like as not, to "teething" More careful examination will show, perhaps, that the child has rickets and also an acute pharyngitis which has rendered manifest a latent spasmophilia Examples could be given in great numbers

Once the great frequency of this relationship is realized, cases will be analyzed with this possibility in mind

If this pathogenesis is demonstrable in a given case it may easily be explained to the mother She comprehends the relationship without difficulty and it is no hard task for the physician to obtain her cooperation in treatment and prophylaxis In this way only can the old traditions that "spasms are due to teething," etc, be combated

I have given only two examples, the same relationship may be traced in many disorders and diseases This relationship of pharyngeal infection to various infant diseases is of greatest importance in in pædiatrics

(2) THE INTERNAL TREATMENT OF PYLOROSPASM

It also occurred to me that a short report on our treatment and results in pylorospasm might be of interest Some years ago I published in cooperation with my colleague, Hamilton, now Associate Professor of Pædiatrics at Johns Hopkins University, an article on this subject in the American journal, *Archives of Pediatrics*

I have at the present writing treated exactly a hundred cases of pylorospasm. Diagnosis was certain in all cases and some of them were very severe There were four deaths Of these four fatal

cases, one was complicated with palatoschisis, in another autopsy revealed dilation of the lower portion of the œsophagus, pointing to the possible existence of congenital atresia of the cardia If these two cases of anomaly be set aside the mortality would average 2 per cent for the hundred cases, if included the mortality would be 4 per cent.

All cases were treated internally The important points in internal treatment according to my experience may be summed up as follows Feeding with breast milk, possibly combined with a smaller portion of buttermilk. Further generous administration of fluids, especially in the form of subcutaneous injections of Ringer's solution Protection against infections as far as possible Of exceptional importance is close observation and care Thus after violent vomiting an immediate feeding or several are given The problem of just when and how often such feedings are required is an important question for the nurse to solve In prolonged cases in beginning anæmia I have occasionally made use of ferrum reductum medication. In some cases camphor stimulation may also be necessary

These are some of the important details of our treatment. The results show that internal treatment may prove very successful.

Without doubt surgical treatment may be needed in certain cases I have not made use of it, partly because we have no surgical ward—transportation from another hospital after operation seemed too risky—but especially because my results with internal treatment were so good

Surgery

UTERINE FIBROIDS, BLEEDING FROM THE UTERUS (METRORRHAGIA)*

By JOHN B DEAVER, M D, LL D
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Our first patient to-day is a woman, thirty-seven years of age, who has been married for seventeen years and has four children living and well She has never had a miscarriage Two years ago she began having difficulty in passing her urine, and when examined by a physician she was found to have a tumor situated in the neighborhood of her uterus While at the present time she has no trouble in urinating and has no pain or discomfort of any character whatsoever, she desires to have the tumor removed as she is afraid it might turn into cancer This fear of a malignant growth is evidently the result of the active crusade by the profession to impress the laity with the importance of early diagnosis and treatment of neoplasms The extremities show extensive varicose veins and there is present a large immovable, though fluctuating, mass which fills most of the right side of the abdomen

Operation—The woman was placed in the Trendelenburg position, apothesine was given intraspinally, and the field of operation swabbed with alcohol and iodine The lower right rectus muscle was incised and a large intramural fibroid removed by opening the uterus and shelling out the tumor There was then performed a supravaginal amputation of the uterus and the appendix was removed (appendectomy), after which the external incision was closed without drainage

Pathological Report—The specimens consist of a uterus, removed at the internal os, and a pedunculated fibroid. The uterus is pale in color and the serosa is smooth, shiny and glistening The musculature is pale, measuring 2 cm in thickness, but at the fundus it becomes very thin and in this area there is found a cyst with a diameter of 6 cm The lining of this cyst is pale in color, rough and shiny and the blood vessels are slightly injected The endometrium is atrophic and there are present many petechiæ. The fallopian tube is 3 cm in length and 5 cm wide It is pale in color The serosa is smooth, shiny and glistening and the lumen is very small The ovary is œdematous The pedunculated fibroid is globular in shape, measures 17 × 15 × 13 cm It is pale

* Personally revised from stenographic notes of a recent clinic at the Lankenau Hospital.

in color and firm in consistency The peduncle with which it is attached has a diameter of 3 cm On sectioning, the mass is found to be of a cellular structure and no cystic areas are present. The appendix, measuring 7 × 75 cm, has a fatty mesentery Both the serosa and the mucosa are smooth, shiny and glistening, the wall being 2 mm thick The appendix is patulous for three-fourths of its length, the contents comprising muco fæcal matter

Although fibroid tumors of the uterus, such as we have here in this woman whose history I have just told you in outline, may develop even in the young, the majority of them are to be found between the ages of forty and fifty, and are most likely to be present in women who have not borne children or who have become pregnant late in life. In my experience, fibroids occurring before the menopause prolong the period of the change of life, while those seen after menstruation has ceased are especially apt to show complications The old view that the climacteric either reduces the growth or arrests it entirely is not in keeping with my own records On the contrary, I see more cases of hemorrhage as well as of degeneration, of one kind or another—sarcomatous, cancerous, fatty, mucoid, œdematous, cystic or calcified—after, than before, the menopause Therefore, provided of course that there are no contra-indications to operation, I advise the fibroid patient seen before the change of life to have the growth removed, if for no other reason than to avoid the complications which are liable to occur after the menopause

I have never thought radium or X-ray therapy in the treatment of myomas and fibromas to be as safe as operation, and the more cases I see where radiation has been used, the stronger is my belief that I am right The mortality of operation in skilled hands is very small, and the morbidity is practically nil, while the morbidity following either of the two forms of so-called "conservative" treatment is considerable, so I feel quite justified in my position. I have always thought, and still think, that both radium and X-ray therapy enhance the risk of future degenerative changes I have never believed fibroids to be innocent neoplasms, even in the absence of symptoms, any more than I believe in innocent gall-stones or innocent duodenal and gastric ulcers This opinion of mine in regard to uterine fibroids, while not accepted by the majority of gynæcologists, is based upon the findings of many thousand dissections *in vivo,* and is not dependent upon material derived from autopsies alone

The signs and symptoms of fibroid tumor are variable In the

majority of cases there is the presence of a lower abdominal tumor, along with menorrhagia or metrorrhagia, dysmenorrhœa, leukorrhœa, pelvic discomfort—the latter depending upon a chronic inflammatory tubal condition—and pressure symptoms caused by the tumor itself, if it occupies the whole or part of the lower, or true pelvis I would have you clearly understand that all fibroids do not bleed, so that neither hemorrhage nor metrorrhagia is necessarily present in every instance

Ordinarily the recognition of a uterine fibroid is easy, but sometimes the diagnosis is impossible until the abdomen is opened, and then even with the tumor in the hand the question of a pregnant uterus cannot always be decided without an incision of the tumor and of the uterus itself I have had this unpleasant experience occur upon more than one occasion, particularly in my earlier days, of finding an unsuspected fœtus when operating upon uterine fibroids, and I may add so have many other surgeons, and they too have been frank enough to publish their similar experiences But I believe it is better to incise the uterus and find a fœtus than it is to make a supravaginal amputation or subtotal hysterectomy and then discover one when it is too late to save the uterus with its contained fœtus

One of the most interesting cases on record of the finding of an unsuspected fœtus with its placenta upon the removal of a fibromyoma is that reported by John B Murphy in the February, 1896, issue of the *International Medical Magazine* This article is all the more remarkable because in the same issue is to be found one of the earliest papers upon Rontgen's discovery, from which so much was expected in these instances, but which, we shall see later on, has its limitations as well as its dangers.

Murphy's patient was a colored woman, thirty-nine years of age, who had been married two years but had had no children, miscarriages or abortions Health had always been good up to the present illness, which began in July, 1895, when her menses ceased and she later noticed a tumor just below the umbilicus There were no symptoms other than the discomfort produced by pressure of the tumor against the edge of the ribs

Physical examination showed a nodular growth, extending above the umbilicus, to the right side One of the nodules below the umbilicus was the size of a child's head, hard and freely movable

laterally No fœtal heart sounds or placental souffle Vaginal examination revealed a large hard mass entirely filling the pelvis Diagnosis was made of uterine fibroid with cystic degeneration. Cœliotomy was performed October 25, 1895, and the uterus removed The mass weighed six pounds, six ounces, and consisted of a large irregular fibroid growing from the posterior wall of the uterus The uterus was enlarged about six inches and contained a sac of fluid When opened a fœtus of about three months was found in the sac, which had not been ruptured The patient made an uninterrupted recovery

The question of the use of X-rays in diagnosing such a condition is most interesting A French surgeon was heavily fined because he had not done so in one instance But we are now told by the most recent investigators that deformities in the child, especially in the way of distortion of the fingers and of the genito-urinary tract, may take place when the Rontgen-rays are applied to the pregnant woman For those interested in the subject I would refer them to Bagg's paper in the INTERNATIONAL CLINICS, series 36, vol. iv, p 26, and Dorland and Huberry's "The X-ray in Embryology and Obstetrics," 1926, pp 25 and 259

The symptoms and signs of uterine fibroids are largely influenced by the site of the tumor For example, if interstitial, that is within the walls of the uterus, it is a purely uterine, usually solitary, growth capable of assuming large dimensions, and causing great discomfort, due to pressure upon the adjacent organs If the interstitial tumor is soft, it may simulate pregnancy When the tumor is in the lower, or true, pelvis it may cause vesical symptoms, constipation, sterility and much embarrassment to the marital relations While this is the type of tumor for which the radiologists claim the best results, it demands in my opinion early operation. Only in the case of the subserous tumor, which is the least damaging in its inroad upon the health of the patient, may removal by operative means be postponed But we must not forget that myocardial changes may occur as the result of the prolonged presence of the interstitial tumor —changes that may be likened to similar ones consequent upon long-standing gall-stone disease

I consider these possibilities as of vital moment when the ques-

tion of conservative *versus* radical treatment in either of the two conditions comes up

I cannot emphasize this too strongly as I have seen precipitate death caused by the sudden failure of cardiac reserve in both conditions The surgeon who has witnessed the most catastrophes is he who has made the greatest number of operations *in vivo* or autopsies

The subserous fibroid is probably more elusive than other myomatous tumors, although the submucous tumor may also be elusive. The subserous fibroid is often pedunculated, and is liable to excursion and thus cause symptoms and signs simulating other intra-abdominal conditions Torsion of the fibroid depending upon the length of the pedicle is one of these possibilities I, however, have only seen one case of gangrene the result of torsion of a pedicled fibroid In an ovarian tumor with a long pedicle, gangrene is not a very uncommon occurrence A pedunculated fibroid may occupy almost any portion of the abdomen The saving grace under these conditions is that the pedunculated tumor is rarely the only fibroid present, therefore vaginal and bimanual examination may clear up an otherwise difficult diagnosis

Among other forms of neoplasm which a fibroid may simulate are tumor of the kidney, of the spleen and a retro-peritoneal growth, especially where a previous peritonitis has rendered it adherent and immovable Peritonitis is usually the result of infected tubes, but very occasionally it may be caused by a degenerating tumor causing ulcerative perforation. A condition that frequently leads one to think he is dealing with a small fibroid tumor is infected tubes adherent to the uterus with much peritubal exudate that has become organized in the presence of uterine bleeding To use radium under these circumstances, if not fatal to the patient, would be disastrous to her pelvic viscera

Among other conditions that may be mistaken for fibroids are a tense intra-ligamentary cyst that pushes the uterus over to one side of the pelvis and is continuous with the uterus and is associated with vaginal bleeding, usually intermittent, also a large hydro- or hæmato-salpinx, and an old pelvic hæmatocele

In the submucous tumor if there are no fibroids palpable *per vaginam* or through the abdominal walls, and there is no protrusion

into or through the external os and the uterine appendages appear normal to touch, the diagnosis can only be made from the history, namely the age of the patient, her appearance, the presence of bleeding, more or less profuse, and bright red in color Instrumental and attempted digital examination of the interior of the uterus as a rule is neither satisfactory nor informative Detection by carrying a curette or sound into the cavity of the uterus of a lumpy interior may be suggestive but not definite

In a woman at or near middle life with rather profuse bleeding from the uterus, and with negative physical findings, the only certain way of making the diagnosis is by hysterotomy If a submucous fibroid is found as the cause of symptoms, enucleation—internal myomectomy—is readily made and the uterus returned to normal Why this procedure, to which I called attention several years ago, is not more universally practised is hard for me to understand In my clinic I am sure it has saved many lives and prevented much morbidity This is a real surgical procedure, logical, philosophical and sound I am inclined to call the intravaginal uterine operations dismal swamp operations

An unusual kind of myoma to which I now call your attention in this discussion is adenomyoma. In this form of tumor epithelial, glandular structures and muscular tissue are present in the new growth The source of the glandular elements has given rise to different opinions Personally, I think Cullen has given the most satisfactory explanation. He believes that most of these tumors start as a diffuse myomatous thickening of the uterine muscle that contains crevices into which normal mucous membrane with its glands grows

The symptoms of this form of myoma differ from the ordinary myoma in that the excessive bleeding is confined to the menstrual periods Pain is more often present in this than in the other forms of tumor and is referred to the uterus at the menstrual periods with no intermenstrual discharge of any kind In the ordinary myoma, the condition of the endometrium plays the important rôle in the presence of hemorrhage, just as the mucous membrane of the bladder in enlargement of the prostate In the bleeding myomata the endometrium is both glandular and hypertrophic and the degree influences the bleeding, which may be occasional, slight or profuse This

is also true of the bleeding prostate where the amount of bleeding depends upon the toxicity of the overlying mucous membrane I make this comparison as anatomically the prostate is the homologue of the uterus

From the little I have said, I hope you will better understand why in the type of case I have been speaking about, I stress the importance of radical as against so-called "conservative" surgery As I view it, in most instances radical surgery which accomplishes permanent cure, in a reasonably short time, is conservative surgery, while so-called "conservative" surgery, which neither cures in the true sense of the word, in that the pathology is not removed but is, as it were, smothered, nor prevents morbidity, is a misnomer We have given this patient real conservative, that is radical, surgery, in that the pathological condition for which this woman came to us has been removed The word "conservative" is too often used in connection with surgery which when practised leaves the house inhabited with a questionable tenant Better an empty house than a questionable tenant

What operation have I selected to make in our next patient, also a fibroid uterus? Assuming that we are right in our opinion that the myoma is an interstitial one, I will expose it through an incision made through the lower right rectus muscle made nearer the medial than the semilunar line This is better than going through the linea alba, because after closing the wound we can appose the muscular and aponeurotic structures, while this cannot be done in the linea alba approach, unless the anterior layers of the sheaths of both recti muscles are opened The latter is more time-consuming and disarranges the structures anatomically In opening into the peritoneal cavity low down, always have in mind the bladder, which if full may be accidentally opened If in doubt when about to open the peritoneum, incise the peritoneum at a point high enough, even at the expense of enlarging the superficial incision, to make sure that the bladder is not endangered The nurses in this clinic know the importance of an empty bladder in low abdominal operations and that we cannot always rely on the patient emptying the bladder—being nervous about the operation—therefore we find it well to pass a catheter Needless to say the catheter is passed with every aseptic precaution I often ask a nurse what is the first thing she does when passing a

catheter, when, if she has been well instructed, she will say, "Wash my hands and put on rubber gloves" The fact that a patient has just voided does not mean the bladder has been emptied There is such a condition as overflow of retention. Many times have I chagrined a nurse and in some instances the interne after having been told the patient has voided, by insisting upon passing a catheter, when a large amount of urine is withdrawn Percussion and palpation over a distended bladder will give fluctuation Fluctuation can also be detected by vaginal touch These remarks are made to emphasize the fact that one cannot be too careful in answering his or her superior officer unless absolutely sure the information is correct, therefore the attention to details is of much moment. Interest, attention and cerebration are some of the qualities in the make-up of a good doctor and of a good nurse

The bleeding that has occurred in making this wound should at once be controlled, preferably by ligature Hæmostatic forceps will do it, but they are more or less in the way Personally I prefer a clear and clean operative field, for thus I can see better and do better work. I introduce the index and middle fingers of the left hand low down into the peritoneal cavity and I immediately come in contact with a smooth, large, hard mass corresponding in position to that of an enlarged uterus, and by lateral traction with retractors I expose to your view that which I felt—a large interstitial myoma The diagnosis has been confirmed by touch and sight, two of the most important of the surgeon's assets in the proper performance of an operation

The next step in the operation is to introduce the first and second fingers of the left hand deep enough in the pelvis to determine whether or not there is tubal or ovarian disease If present and extensive this might forbid delivering the tumor I do not find any complications, therefore with the retractors *in situ* and the lateral margins of the wound gently but well separated I spread this moist rubber sheet over the intestines presenting in the lower part of the abdominal cavity and over this two or more moist, abdominal gauze pads In this way I wall off the field of operation I then deliver the tumor, carry it forward so that I can see the posterior surface of the supravaginal cervix, next I cut through the peritoneum overlying this part of the cervix at its junction with the body of the uterus I next carry

the tumor backward, at the same time pulling it upward, this exposes the peritoneal covering of the uterus where it is reflected onto the bladder, which is a little below the level of the junction of the round ligaments with the uterus I cut through the peritoneum transversely at this point, and with a small piece of moist gauze or gauze sponge, carry it and the bladder downward and forward beneath the symphysis pubis, where the gauze and the bladder are held (by a retractor, placed in the lower angle of the wound) Looking into the wound with the aid of a Cameron light, there will be seen the upper portions of the broad ligaments, the round ligaments and below the latter the perimetric tissues will be exposed, having carried the lower portions of the anterior layers of the broad ligaments down with the bladder I examine the ovaries and find them healthy, therefore I will not remove them With a large Spencer Wells forceps I grasp the broad ligaments inclusive of the round ligament to the inner or uterine side of the ovary When the ovary is to be removed the forceps are placed to the outer, pelvic side of the ovary With the broad ligament held taut by the forceps the ligament to the uterine side of the forceps is cut through as far as the end of the forceps between it and the uterus, when by carrying the forceps and the included portion of the ligament well down into the lower pelvis the uterine vessels are exposed and grasped by a pair of hæmostatic forceps at a point corresponding to the junction of the supravaginal cervix with the body of the uterus This is repeated upon the opposite side, when the uterus is freed on its sides, the body is cut away from the supravaginal cervix by two oblique incisions, one in front and one in back, thus leaving a V-shaped cavity in the cervix. Next with the cautery the extreme upper portion of the cervical canal is sterilized Bearing in mind the possibility of subsequent carcinomatous change in the endothelial lining of the cervix, I formerly thoroughly cauterized the entire canal, but having seen this followed by profuse vaginal discharge, discomforting to the patient, I have discontinued the practice The discharge is the result of degeneration and regeneration of the cauterized cervical tissue Furthermore, I feared the danger of provoking changes that might favor the development of cancer, so now, for aseptic purposes only, I simply cauterize the upper end of the cervical canal.

I now transfix the stump of the left broad ligament on the pelvic

side of the clamp with a curved needle carrying a long No 2 chromic gut double ligature and tie the stump off on both sides The clamp is then removed and the posterior lip of the cervix transfixed with the needle still threaded, the needle is then unthreaded and the other half of the ligature threaded in the needle and the latter, with the ligature carried through the anterior lip of the cervix. Then traction is made on both ends of the ligature and the stump of the ligaments carried into the cavity of the cervix and the ligatures tied tightly This is repeated on the opposite side when the stumps are further fixed by passing two or more sutures through the lips of the cervix and the stumps The next and last step is to bring the reflected serosa of the uterus continuous with that of the bladder over the stump of the cervix containing the buried stumps of the broad ligaments and sewing it to the posterior surface of the cervix.

The appendix, if present, is next removed. The gauze pads and rubber sheet in the abdomen are taken out, the gauze is counted and the wound closed with layer sutures of catgut and two or more through-and-through silkworm-gut sutures

Needless to say I regard this the best operation for supravaginal amputation of the uterus for the following reasons First, there is little or no chance of the cervix prolapsing Secondly, the cervix is held in the highest position possible in making a subtotal hysterectomy, where intra-abdominal pressure is less disturbed than in the operation more commonly made, which simply suspends the cervix and does not prevent prolapse, and further causes more disturbance of the intra-abdominal pressure The operation, as you have observed, is a very simple one This is the strongest argument in its favor I therefore commend it highly I am often asked the question, what about the ureters? The ureters passing over the floor of the pelvis are quite distant from the line of amputation of the supravaginal cervix and, therefore, are in no way endangered In doing a complete hysterectomy, the most important part of the operation is avoiding injuring the ureters This can only be done with absolute surety by exposing them between the layers of the broad ligament through which they pass, from the point where they cross the common iliac vessels to their point of juncture or where they enter the walls of the bladder near their termination into the walls of the bladder The uterine arteries will be seen crossing the ureters at a right angle

I make it a rule to see clearly both the ureters and the uterine arteries before I clamp and cut the arteries prior to cutting the vagina in the release of the cervix. If this dissection is carefully made the ureters will not be injured I liken this step in the operation of complete or total abdominal hysterectomy to exposure of the hepatic and common ducts prior to dividing the cystic duct in removal of the gall-bladder May I repeat, nothing short of this extreme care will protect the patient against possible risk. In this work, I want to emphasize the importance of using the Cameron light, which enables one to see well, and to see well is to do well

In making a complete hysterectomy, I frequently amputate the body of the cervix, especially when the uterus is large, by cutting through the supravaginal cervix and grasping the cervix with a pair of long and strong volsella forceps which make the final steps of the operation simpler in that with the body of the uterus being out of the way, one gets a clearer view of the floor of the pelvis, so important in a deep pelvis in a fat patient This also makes easier the control of bleeding Need I say more? Furthermore, it is my practice in this operation to adjust a pair of long right angle forceps to the vagina a short distance below the supravaginal cervix and cut the vagina across above the clamp with the cautery knife which sterilizes the tissues Before removing the clamps the vaginal wound is closed by a continuous chromic catgut suture This makes for a sterile operation, which is not the case when the cervix is cut out of the vagina Furthermore, the use of the clamps makes it important to have the terminal portions of the ureters before the eyes to prevent their injury and subsequent ureteral fistula, a not very infrequent occurrence, unless the operation is made in a strictly anatomical manner This forces me to stress the importance of the pelvic surgeon being a topographical anatomist, if the patient is to be given the best care

These points should impress you with the responsibility of the surgeon, which if thoroughly appreciated and carried out will relieve his responsibilities and trials and give him joys I hope you will pardon me for going so much into detail—my apology for doing so is that when the heart is full, the mouth overfloweth

In the presence of a fibroid with complications, as in the presence of a tumor locked in the true pelvis, out of which it cannot be delivered by the ordinary means, such as traction through the medium of a

volsella forceps, or a cork-screw, it can best be removed by making a transverse incision through the peritoneal covering at its reflection onto the bladder, when the bladder with a small piece of moist gauze is carried downward and forward, and the uterine vessels exposed These are clamped with long hæmostatic forceps, divided and tied and the cervix is then cut across, thus exposing the cervical canal, the upper end of which is cauterized, making it sterile The upper end of the cervix is next grasped and lifted upward when the tumor can be delivered This is made easier in some instances by having an assistant introduce two fingers in the vagina, contacting with the tumor and pushing upward Again, more may be accomplished by the finger in the rectum. The fibroid having been brought up into the false pelvis, the remaining part of the operation is carried out as described in the operation of supravaginal amputation. In a few cases it will be an advantage to bisect the tumor longitudinally, removing each half separately by cutting the cervix transversely, clamping and dividing the uterine vessels, lifting the one half up, clamping and cutting the upper portion of the broad ligaments and repeating the same procedure on the opposite side Where there is an intra-ligamentary cyst present, or the fibroid lies between the layers of the broad ligament the overlying peritoneum is cut transversely and the cyst or fibroid enucleated, care being taken to avoid injuring the ureter In the event of the ureter being torn across, the simplest and best procedure is to transplant its proximal end into the bladder and tie off its distal end, to prevent regurgitation of urine Anastomosing the ureter is too uncertain I do not recommend tying both ends of the ureter and trusting to the kidney to atrophy Should the ureter be torn across too high to allow transplantation of the upper end into the bladder, it is better to remove the kidney and tie off the lower end of the ureter One of the most difficult complications is that of chronically diseased tubes and ovaries, with or without pus, involving the terminal sigmoid and upper rectum, all of which viscera are so tightly adherent as if masonried together When the sigmoid or rectum is torn, careful repair must be made This may be facilitated by the introduction of a colon tube which should be left in and stitched to the skin to the side of the anus In this type of case, where the enucleation has been difficult and tedious whether the bowel has been torn or not, I have a colon

tube passed and leave it in. These cases must be drained, because a fæcal fistula results in a certain percentage In my experience the fistula closes spontaneously, even when all the fæcal matter comes through it for two or three weeks Occasionally a small fistulous tract remains that discharges pus and at times gas These cases must be re-operated sooner or later Where the bladder is torn, it should be closed and a retention catheter introduced, which should not be permanently removed for at least ten days The eyelet of the catheter must be kept open by injecting a small amount of normal salt solution once or twice a day Where the catheter becomes blocked with phosphatic deposits it must be taken out and a new catheter substituted These cases call for much attention upon the part of the nurse From what I have just said you will appreciate some of the trials of the surgeon. I am forced to say to you that the all-round general surgeon who has an equally large experience in abdominal surgery is the better able to handle the more complicated case than the specialist, therefore, those of you who hope to specialize should first, for a length of time, practice general surgery It may seem out of place for me to speak to you in this way, but my aim is to give you information that will in the end be of advantage to you and your patients This is borne out by the experiences of the great master surgeons of the past.

Before presenting the next patient I wish to say to you that in all of these pelvic cases the appendix should be removed whether diseased or not. I am constantly operating on patients with acute and chronic appendicitis who have had previous pelvic operations, and where the appendix was left. A death under these circumstances is a death that could have been prevented

The next patient I present is a woman, thirty-one years old, married eleven years, who has never conceived Her chief complaint is vaginal bleeding This woman tells us that two and one-half months ago she began to suffer pain in the left lower abdomen Following the onset of pain she commenced to bleed irregularly, so much so that she lost track of her menstrual periods This may be spoken of as a bleeding uterus Let us first ask ourselves the question, what are the causes of a bleeding uterus occurring at this time of life, in other words, in the child-bearing period? The causes of bleeding in this period of the married woman and some-

times when not married are the result of pregnancy, abortion, miscarriage, accidental separation of the placenta, placenta previa, extra-uterine pregnancy, vegetations and post-partum hemorrhage

Of these varying types of bleeding, placenta previa, accidental separation of the placenta, extra-uterine hemorrhage and post-partum are the most important I wish you to distinctly understand I am speaking of patients in the hospital only and not those treated in their homes I mean, of course, a well-equipped hospital with a competent staff including doctors, nurses and a modern operating room with the equipment to make it such, which includes the modern laboratory, the director of which is finished in his line, thus affording the best assistance that can be offered, immediate bacteriological and pathological examinations, that is the examination and prompt report upon smears and frozen sections Patients not fortunate enough to have the advantage of such hospital care are handicapped

Placenta previa, especially the central attachment type, is best treated by cæsarian section. It may interest you to know that the first cæsarian section for this condition was made in this hospital many years ago, with recovery of both mother and child, a girl baby who to-day is herself a mother In the other types of placental attachments the obstetrician prefers delivery by way of the vagina, but notwithstanding I do not agree with them More lives, of both mother and child, are lost in the latter practice, to say nothing of the extensive lacerations of the birth canal in those who recover from the delivery, making for a considerable morbidity My remarks upon the treatment of placenta previa apply to a great extent to the treatment of accidental separation of the placenta, especially where the accident occurs late in pregnancy and the loss of blood is great In extra-uterine hemorrhage operation should be made immediately following the diagnosis. In cases of doubtful diagnosis a small incision through the vault of the vagina will usually clear up the doubt. I am very positive in my attitude upon these cases as I have successfully operated so many without regrets

In our hospital experience we practically never see post-partum hemorrhage in the first few hours after labor, the patients usually being sent in after attempts have been made to control the bleeding The first thing to do is examine the patient carefully Determine first whether the uterus is ruptured, and if it is not, and the bleeding

is not profuse, examine for lacerations of the cervix high up, as well as in the vagina and perineum Occasionally, but rarely, a vessel of the soft parts torn in the delivery will be the cause and if so, ligation of the vessels suffices to stop the hemorrhage Next massage the uterus, Credé method, at the same time giving the patient a dose or two of ergot and a vaginal douche of hot normal salt solution If the placenta or a broken portion of it has not been expelled massage will usually force it into the vagina So long as pieces of placenta are in the uterus the bleeding will not stop, in this respect simulating bleeding of the prostate, where pieces of the prostate are left, therefore in either case the pieces are to be removed, by the fingers, the dull curette or with placental forceps In our experience the placental forceps are not so satisfactory for this purpose as is the curette The finger when it can be safely carried into the uterus is the safest and surest If the bleeding is not arrested by this means, the uterus is packed with sterile gauze, steadying the uterus by grasping the cervix with a pair of volsella forceps Having packed the uterus, it is best to pack the vagina also Deep or extensive lacerations, unless they are the source of the hemorrhage in patients already greatly weakened from the loss of blood, had better be left for subsequent closure In extreme cases blood-transfusion may be necessary, and while waiting for and obtaining a donor the bleeding can be arrested by giving an intravenous infusion of normal salt solution. All manœuvres, including the preparation of the field, must be done under the most strict aseptic precautions Bleeding several days after a full-term delivery, miscarriage or abortion, is usually caused by retained portions of placenta, and in the presence of infection should not be dealt with mechanically In this clinic it is our practice to treat these patients by anatomic and physiologic rest, namely, lavage of the stomach if there is peritonitis present with absence of peristalsis, morphia hypodermically for pain, nothing by mouth, the Murphy drip of normal saline solution to which is added whiskey and glucose, hypodermoclysis of salt solution if the urinary output is below normal, ice to the abdomen, the sitting position, and hot saline vaginal douches if they do not cause discomfort, the vulva covered with an antiseptic pad Very rarely indeed do these measures fail Should the patient develop septicæmia, blood-cultures as well as culture of the interior of the uterus are made If the

blood-culture shows streptococcus, large doses of anti-streptococcus serum 100 c c are given daily until a negative culture is obtained It is needless for me to say care in the use of this serum treatment is paramount

Next a few words about the bleeding non-pregnant uterus This most often occurs at the approach of or in middle life The bleeding non-pregnant uterus is rich in etiological factors, the more common being carcinoma of the cervix or fundus, fibroma, especially the interstitial and submucous varieties, inflammatory disease of the tubes and ovaries, subinvolution, flexions and versions, fibrosis, so-called "essential" or myopathic hemorrhage, polypoid growths, or polypoid endometritis, and hemorrhagic endometritis

(To be continued in the 150th anniversary number of the INTERNATIONAL CLINICS, June, 1928)

OPERATIONS AND DEMONSTRATIONS AT THE CHIRURGISCHE UNIVERSITATS KLINIK, FRANKFURT-AM-MAIN *

By PROFESSOR VICTOR SCHMIEDEN, M D

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(1) AMPUTATIO MAMMÆ

PATIENT, forty-nine years old, discovered six weeks before operation a tumor nodule in the left breast No discomfort Examination revealed a hard tumor, the size of a hazel-nut, that adhered to the substratum The skin covering it was movable, the mammilla drawn in No glandular metastases demonstrable in the axilla

Typical amputation of the breast with extirpation of the axillary lymph-glands

Pathologic-anatomical Diagnosis—Simple carcinoma

The wound healed and the patient was discharged well three weeks after operation.

(2) GASTROTOMY

Patient (convict), twenty-eight years old, had four weeks previously swallowed two spoon handles. Hitherto no discomfort The foreign bodies had not yet left the stomach and could be seen plainly in the X-ray

Operation.—Median incision Foreign body palpable in the duodenum, no rupture of the wall The foreign body was pushed back into the stomach Gastrotomy Removal of the two spoon handles The wall of the stomach sutured in layers Suture of the abdominal wall Primary healing and patient returned to prison ten days after operation

(3) LAMINECTOMY

Patient, fifty-six years old Paralysis of both legs, bladder and rectum since 1926, with disturbed sensibility and gibbosity (tbc)

Beginning of treatment September 28, 1926, with extension

* On the occasion of the visit of the Interstate Post graduate Assembly of North America on July 4, 1927

(Glisson), massage, and electrization. The rectal and bladder paralysis disappeared and the sensibility disturbances showed improvement Motility showed only a very slight improvement so that laminectomy was indicated Operation July 4, 1927

Exposure of the spinal cord in the region of the gibbosity and resection of D 9–12, as the operation progressed further removal of DL 1, the dural sac was markedly constricted Under the D 12 a narrow constriction due to compression from the consolidated and flexed thoracic vertebræ. Wide exposure was made, with complete view of the dural sac, which was not opened in order to examine the cord Sutures made in rows, the cord held in suspension.

Course—After an initial exacerbation of the neurologic findings following the operation (September 1, 1927), the bladder and rectal examination was negative Sensibility almost completely normal Motility in legs increasing The probability of letting the patient get up in a Hessing corset is under consideration

(4) AMPUTATIO FEMORIS

Patient, eighteen years old. Sarcoma of the left tibial diaphysis Repeated X-ray treatments gave no relief Progressive growth of tumor Metastases so far not demonstrable

Typical bloodless amputation of the thigh in the middle third Careful attention to stump

Secondary healing The stump is now ready for use

(5) UNILATERAL PULMONARY TUBERCULOSIS

Operation (Professor Goetze)—Radical phrenicotomy Resection of the main trunk of the nervus phrenicus and also the nervus subclavius, in two-thirds of all cases Professor Goetze saves the deepest root of the phrenic nerve

FILM DEMONSTRATION

(1) Two historically valuable films of a typical thigh amputation and an amputatio mammæ, from the year 1907, were shown in which von Bergmann operated upon during his connection with the Berlin Chirurgische Universitats Klinik.

(2) *Laminectomy*—Film taken in the Chirurgische Universitats Klinik (Surgeon, Professor Schmieden)

Injection of the field of operation with 1 per cent adrenalin

solution to diminish bleeding Skin incision Blunt separation of the musculature from the processus spinosæ Removal of the vertebral arches with Luer's forceps Painstaking hæmostasis Fixation of the dural covering with interrupted sutures Opening of the dural sac An extramedullary neurinoma about the size of a hazel-nut was exposed and bluntly enucleated Careful suture of dura The covering tissues sutured in layers

CLINICAL DEMONSTRATION (PROFESSOR SCHMIEDEN)

(1) *Operations for Recurrence in Brain Tumor*—(*a*) A cortical gliosarcoma in the left gyrus angularis, removed twice within a half year as a tumor the size of an egg In each case convalescence was very rapid and the focal symptoms disappeared rapidly After another half year a third operation—now inoperable

(*b*) Sarcomatous meningioma of the temporal lobe extirpated successfully four times within two and one-half years

The increasing malignity of the recurrences was emphasized Operations for recurrence should be tried more frequently than hitherto

(2) *Mesenteric Cyst*—Tumor in the abdomen, whose point of origin could not be determined before operation A mesenteric cyst of about the size of an apple was revealed near the duodenojejunal flexure Extirpation with careful avoidance of the mesenteric blood-vessels

(3) *Total Emasculation*—Total removal of the external genitalia, including the inguinal glands in one piece, with implantation of the urethra into the rectum. We had to deal with an extensive genital carcinoma after Rontgen treatment of a primary tuberculosis of the epididymis

(4) *Demonstration of Cases of Adhesive Pericarditis*—Five recent cases, four with splendid functional results were shown and one death reported

(*a*) Complete indurated pericarditis with atrophy, simultaneous mitral and aortic insufficiency

Decortication of the left ventricle and auricle and also a small part of the right ventricle

Rapid disappearance of obstructive symptoms, considerable improvement in conductivity

(*b*) Patient has been well for two years in spite of pneumonia, with post-operative empyema, that caused suppuration of the pericardiectomy wound

(*c*) Patient had been treated repeatedly with X-rays for caries of the sixth left rib Severe X-ray burn with left induration and shortening of the pericardium, and beginning adhesion to the diaphragm Resection of the thorax and separation of adhesions

Patient is now free of symptoms

(*d*) A case of cord-like adhesion of the cardiac apex with systolic diaphragmatic traction cured by phrenicotomy

(5) *Plastic Operation on the Ala Nasi* (Konig) —In cancroid of the ala nasi free transplantation of the helix.

(6) *Congenital Stenosis of the Œsophagus* —A six-year-old girl X-ray revealed a stenosis of the length of a finger in the thoracic portion. Most serious obstruction to swallowing Filiform bougies could scarcely pass the stenosis A gastric fistula was made and continuous bougienage according to Hacker's method with olive-shaped bougies Complete recovery after one-half year's treatment

(7) *Zenker's Diverticulum in Cervical Portion of the Œsophagus* —Demonstration of four specimens In all cases complete recovery A diverticulum the size of a small apple was completely covered with muscle This would presumably have to be interpreted as a congenital anomaly

(8) *Radical operation* for removal of a tuberculous focus in the body of the third cervical vertebra.

1922 Spondylitis cervicalis with retropharyngeal abscess Progressive pressure symptoms

1923 Removal of a focus the size of a pea with sequestra from the third cervical vertebra, with simultaneous treatment by the retropharyngeal abscess

Since the beginning of 1924, free of symptoms and discarded leather-collar support

(9) *Plastic substitution of the entire tibial diaphysis* after osteomyelitis with suppuration of the ankle-joint The plastic operation was accomplished by implantation of the well-preserved fibula in the proximal epiphysis of the tibia The patient is now fully able to keep up his work.

(10) *Chronic Dislocation of the Shoulder*—Operated on at two years of age by the Clairmont method.

The shoulder-joint is now freely movable and functions properly The dislocation has not recurred The result is splendid, and the method seems far superior to any other

(11) *Carcinoma of the Urachus*—Before operation a bladder tumor with diverticular formation was cystoscopically revealed A gelatinous carcinoma about the size of a fist, adherent to the posterior abdominal wall and to a loop of the small intestine Total extirpation. Recovery.

REGENERATION AND DEGENERATION IN FRACTURE HEALING AS AN INDICATION FOR TREATMENT

Lecture on the great difference between regeneration of the callous tissue in fractures in subcutaneous and in operative healing as demonstrated by animal experiments. Also Rontgen demonstration of the increased degeneration of the fracture ends in human beings after surgical interference and especially after suture The result is always a regular, additional loosening also of relatively securely sutured fractures Only oblique fractures constitute an exception, as these, by means of a dependable circular suture and their wedge-shaped ends, automatically reduce themselves

A dependable suture is a double loop with 1 mm. Krupp wire and simple drill closure Tibiæ sutured in this way have a resistance against compression of more than 100 kg With a successful suture the patient may in these cases be treated without casts and may get up as soon as the wound is healed.

The conservative method has also developed from the study of the changes in the fracture ends Presentation of the Ball-wire osteosynthesis (See *Proc Chirurgical Congress,* 1927, Berlin)

Doctor Scheele demonstrates (1) X-ray findings in the kidneys, and as a contribution to diagnosis of wandering kidney, shows pyelograms taken in the standing and recumbent positions The movements and evacuation time of the floating kidney may be demonstrated, which is of value as an indication for nephropexy

(2) Pyelography is also of use in demonstrating a palpable abdominal tumor, whether associated with the kidney or otherwise The palpable tumor is displaced and an X-ray taken in each of the

extreme positions, while the renal pelvis is filled with an opaque medium Extrarenal and renal growths show different results The renal tumor shows a displacement of the whole pyelogram or flexion of the longitudinal axis of the pyelogram, with displacement of the ureters Extrarenal tumors on displacement show no change in the position or shape of the pyelogram

(3) The evacuation period of the renal pelvis may readily be demonstrated in serial rontgenograms taken at intervals of two to three minutes This procedure is valuable in the diagnosis of hydronephrosis

(4) Report on an operation performed five years ago We had to deal with a contracted kidney with ureteral reflux on both sides after cauterization of the bladder with acetic acid Through a portion of intestine enclosed in it and laterally anastomosed with the apex of the bladder, an enlargement of the bladder was attained and the subjective symptoms of incontinence and dilatation pains of the hydronephrotic kidney disappeared

The patient to-day, after five years, feels well, is continent and suffers no pain.

(5) *Acute aniline poisoning* causes violent irritation of the bladder, frequent desire to urinate and bleeding from the bladder From cystoscopic pictures, a case is described, in which acute aniline poisoning led to violent hemorrhage from the bladder In the course of six weeks there was gradual absorption of the blood extravasation and complete restoration of the vesical mucosa

(6) A forceps was shown, which can be introduced through the ordinary cystoscope for obtaining endovesical samples of tissue for diagnostic purposes These samples are of great value in differentiating various types of cystitis

DEMONSTRATION BY A. W FISCHER

(1) *Carcinoma and Chronic Irritation.*—By means of numerous microphotograms it was shown how epithelial changes occur in the gall-bladder from chronic inflammatory irritation and go on to carcinoma development.

One case was especially clearly demonstrated, in which carcinoma was only microscopically demonstrable In the stomach exactly similar changes in the epithelium occur from chronic inflammation

Here a case was shown in which a carcinoma, about the size of a ten-cent piece, involving only the mucous membrane, was found

Especially impressive was a case of chronic inflammation of the tongue with simple ulcer (diagnostic excision), with transition to carcinoma one-half year later Also a case of syphilitic rectal stenosis in which attempts at bougienation were continued for more than half a year From this continued irritation a pavement-epithelium carcinoma developed Finally, with these cases belongs a recently observed case of Bilharzia papilloma of the bladder

(2) *Tumor of the Carotid Gland*—Demonstrated from photograms The tumor was extirpated, whereupon it was discovered that the carotid had entered the tumor (expansive pulsation)

Histologically was found an undifferentiated giant-cell tumor of malignant structure, resembling the undifferentiated tumors of the suprarenals

(3) *Large Frozen Sections*—Demonstration of a series of large frozen sections from the service of the Berlin pathologist, Christeller

Carcinoma of the cæcum, carcinoma of the transversum, bladder carcinoma with cyst of the urachus, diffuse fibro-adenoma of the breast, gastric papilloma, etc.

(4) *A Series of Röntgenograms from the Service of A. W Fischer*—Observations of contrast medium, injection, evacuation, air-insufflation, in recumbent, standing and sitting positions, etc. The method shows instead of a relief picture of the injection a plastic, transparent intestine whose walls are made visible by a fine deposit of barium

Demonstration of carcinoma, tuberculosis, polyposis

H Peiper, Frankfurt-am-Main, shows the technic of pyelography in a series of Rontgen diapositives, *i.e*, the rontgenographic demonstration of obstructions within the vertebral canal A large series of spinal cord tumors was shown, in which the more or less complete obstruction of the vertebral canal resulted in the most varying pictures of the iodol (40 per cent iodipin) A brief reference to necessary caution was given and the fact emphasized that since the introduction of this method many cases of spinal cord tumor have been diagnosed which would scarcely have been recognized as such from the neurological picture

SURGICAL DEMONSTRATIONS AT THE KOMMUNE-HOSPITAL OF COPENHAGEN, JUNE 20, 1927

By P N HANSEN, M D
Copenhagen, Denmark

GENTLEMEN This hospital is "Kommunehospitalet i Kjobenhavn" It was built in 1859–1863 and taken in use in 1863, nevertheless, in spite of this venerable age, I daresay that it is tolerably "up-to-date" In this hospital, my renowned countryman, Dr Chas Fenger, from Chicago, whom some of you perhaps remember, received almost all his medical education

With its more than 1000 beds it is the biggest hospital in our country As you will remark, it has a very favorable situation, on one side there are great gardens (botanical garden of the University, King's Garden), on the other side "the lakes" of Copenhagen.[1] Originally it was outside the town, but now it is almost in its centre

It has six departments—two surgical (Doctor Collin and Dr P N Hansen), two for internal diseases (Doctor Bing and Professor Bang), one for mental and nerve diseases (Professor Wimmer), one for dermato-venerology (Professor Ehlers) Further, a section for ophthalmology (Dr Chas F Bentzen) and one for otolaryngology (Doctor Mygind), a very good pathological institute (Dr L Melchior) and an installation for X-rays and light therapy (Doctor Biering)

In the surgical departments we receive patients with "surgical disorders," *e g*, also patients with cerebral diseases, with urinary and gynæcological disorders, etc

Professor Wimmer is a member of the faculty, the State Hospital (Rigshospitalet) having no department for mental and nervous diseases The chiefs of the surgical departments and of the departments for internal diseases are "Docents" at the University All in all, our old hospital has a good deal to do with the education of Danish physicians.

After these introductory remarks I should like to show you three patients from different branches of the general surgery I should much prefer to speak Danish to you When I am visiting you, cer-

[1] Its beautiful green cupola forms a prominent feature in the silhouette of our city

tainly you will speak Anglo-American to me, but there are certain differences between a big nation as yours and a little nation as mine Now, I will do my best, and I hope that you will understand me My three patients have one common feature—in all of them I have had diagnostical difficulties and, to tell the truth, I have made some mistakes, I feel sure that in the U S A. you never make diagnostical mistakes!

CASE I is a lad, eighteen years old, who was suffering from *a congenital cystic tumor in the anterior mediastinum Probatory excision, drainage, as the cyst will not collapse—thoracoplastic operation, two weeks later extirpation Recovery*

History—No disposition for tuberculosis In childhood three times pneumonia In 1921 and 1923 "influenza" without pulmonary complications

He was taken ill in the month of December, 1925 The symptoms were a hard, dry cough with expectoration of some muco pus, very evil smelling, about 100 cm.³ in the twenty four hours Now and then a little elevation of temperature. No tubercle bacilli to be found in the sputum Otherwise he was quite well

Examination—Sound looking, a little meagre, chest well built There was dulness for percussion on the foreside from the first to the third left rib The respiratory murmur is here not to be heard, no râles, no pulsation The heart very much dislocated to the right

X-ray Examination—In the left lung is seen a cavity, 12 × 9 cm, half full of liquid The limits are quite sharp, there is no trace of infiltration in the circumference Apparently it adheres to the anterior chest wall The heart, the great vessels and trachea are displaced to the right

What is the nature of this cavity? It does not resemble an interlobar empyema, it is not an abscess (no infiltrative process in the circumference) It may be an isolated bronchiectatic cavern in an "accessory" lung, a congenital anomaly with infection as a result of the influenza Probably it is not an echinococcus cyst

After puncture of the cyst and evacuation of 200 cm.³ of the pus content, there are injected 40 cm.³ of "iodine brine" Immediately after the injection the patient gets a coughing fit and a taste of iodine brine in the mouth, and on skiagraphic study one notes that there must be a connection with the bronchi, whose fine ramifications are filled behind the cyst, further, that on the walls of the left main bronchus there is iodine brine Towards the middle line there is a fine prolongation of the shadow of the cyst, that apparently goes to the left main bronchus

Diagnosis—*Congenital cyst of the mediastinum antrum* (Dr H Möller)

Now, I must confess that I had some doubt with respect to this diagnosis, as such a cyst is a very, very rare disease I thought it more probable that the disease in question was, after all, an interlobar empyema So, after resection of the second cartilage, I opened the cavity, excised a bit of its wall and put in a drainage tube

Microscopical Examination of the Excised Tissue—Fine fibrillary connective tissue with many vessels and islets of lymphoid tissue. Inside there is a single layer of epithelium of cylindrical cells, small glandular tubes push down in the stroma under the epithelium, round the numerous vessels are seen many leuko cytes There are also isles of hyaline cartilage surrounded by mucous glands with goblet cells

Histological Diagnosis—Congenital bronchiogenous cyst with inflammation (Dr L. Melchior)

So the diagnosis was verified In the following time there was much secretion, and the cyst showed no tendency to diminish, it was held distended in the thoracic cavity I therefore thought it suitable to produce a certain collapsus in making a thoracoplastic operation before trying to remove the cyst I then made a resection of the second and seventh ribs on the left side. This time he also stood the operation well, the wound healed rapidly, the cyst collapsed considerably

Fourteen days later, on the 24th of September, 1926, in general anæsthesia, we proceeded to the task of removing the cyst—and a very exciting task it was indeed! [formed incision, resection of the second and third cartilages and ribs The cyst wall was tolerably tough and could easily be made free to a great extent, but in some places I must make use of cutting instruments So, by degrees, I loosened it from the left pleura, from the pericardium, from the right pleura and the great vessels, without lesion of these organs Then there was left only the connection between the cyst and the left main bronchus The cyst was cut away, the mucous membrane cauterized, a ligature applied The musculo-cutaneous flap filled up a good deal of the remaining cavity, and in the rest a tamponade was put in

He was a little pale after the operation, the pulse accelerated. Shortly after he received a blood transfusion (blood taken from his mother)

He made an excellent recovery without complications Three weeks after the operation he got out of bed For a short time there was an aërial fistula, which closed a couple of weeks later And now, as you see, he is quite well, in every respect a blooming lad. Yet, of course, there is a little deformation of the left side of the chest.

Time does not permit entering into discussion with regard to patho genesis of the cyst, operative procedure or literature There was, as I have already said, a fine connection between the cyst and the left main bronchus, if it then ultimately was a diverticulum or if it must be explained in another way, I should believe it impossible to decide. The cyst you see here, it is bigger than a clenched fist.

CASE II—A man, fifty-four years old *Growth (fibroma) of the small intes tine, invagination, obstruction Resection of intestine Recovery*

Here you see, Gentlemen, a stout man, fifty four years old His health has always been excellent until the beginning of this year Then, rather suddenly he got ill with dyspeptic symptoms Pain, especially in the left hypochondriac region soon after the meals, further some vomiting and nausea He did not go to bed A medical man found hyperchlorhydria and blood in the stool

Suddenly, on the 26th of February, he had, when working, a very severe pain in the heart region, irradiating in the left shoulder and arm, no vomiting, no nausea He came in here seven hours later with the diagnosis Perforating ulcer of the stomach Temperature 39 5° C, pulse 100

To cut the matter short By thoroughly examining him in the following time (also by test meals, X ray examination of the gastro intestinal tract, Wassermann reaction, etc.) we were not able to come to a diagnosis. Tempera ture very soon became normal, no tumor to be felt in the abdomen, no blood in the stools Now and then a little pain after the meals He felt tired, otherwise well Dismissed on the 22nd of March

But he soon returned because he suffered more than before from abdominal pain and vomiting The bowels acted twice the day before his admission, not since

And now there developed a typical, not very acute, intestinal obstruction, in spite of all our endeavors But what was the cause of this obstruction, and where was its seat? I must confess that I was quite at a loss with regard to these questions, there was nothing to be seen or to be felt in the abdomen Proctoscopy and X ray examination were out of the question

But operation became necessary In regionary anæsthesia I made an incis ion in the left side The coils of the small intestine were much distended and the wall very much hypertrophied Now I saw a strong band going from a coil of the intestine to the abdominal wall I thought that here, perhaps, was the cause of the obstruction, the band was cut through But in further examining the conditions I found a portion of intestine that was not distended, not hyper-trophied at all, at the transition from the distended to the not distended gut I now saw a sausage formed swelling quite resembling an intussusception, some 25 cm long, but I could not see any neck of intussusception But in the interior of the gut I felt a growth To say it with a few words I made a resection of the swelling in uniting the gut side to side The result of the operation was extremely satisfying, and, as you see, the patient is now quite well and has left the hospital

In examining the removed swelling you see that there is a petrolate growth, the size of a hen's egg The microscopical examination has shown that it is a *fibroma*, of benign structure But this growth has caused an intussusception of the intestine that must be of very long standing as the serous layers of the entering and the returning layers are quite coalesced, so that the neck could not be seen

So you see that in spite of the shortcoming of the diagnosis, the result was favorable I should only wish to point out the incongruity of the anatomical lesions and the symptoms I feel sure that the growth and also the intussus ception were of a longer duration than the clinical symptoms For a certain time, then, the anatomical changes have developed without symptoms

CASE III—A lad, sixteen years old *Very severe fracture of the pelvis, extraperitoneal rupture of the bladder, rupture of the urethra (?), lesion of an intraperitoneal organ?*

Shortly before his admission in the hospital, on the 19th of May, this year, he was hit on his right hip by a very heavy iron plate, weighing, he says, more than 500 kilos He was in a state of shock, no loss of consciousness, no vomit-ing, there has been some hemorrhage from the urethra

Now, at the very first examination we saw that he had acquired a very severe fracture of the pelvis (X ray examination later on Comminuted fracture of both ossa pubes, dislocation of fragments) Insofar the situation was quite clear

But further, there was a considerable hemorrhage from the urethra, a big

swelling in the perineum (blood extravasation), he could not make water, when, *later on*, I tried to introduce an instrument in the bladder, it was impossible Consequently, perhaps there was also *a rupture of the urethra*

Some hours later, the situation had become still more complicated Elevation of temperature, acceleration of pulse, the abdomen distended, sore, with muscular rigidity all over, no dulness, he has vomited So, then, there was "peritoneal irritation," perhaps an intraperitoneal lesion (rupture of the bladder?) with peritonitis?

I found the situation so alarming that I thought it necessary to perform a laparotomy, but there were no lesions of the peritoneal organs In the subperitoneal tissue there were enormous extravasations of blood. I then closed the wound, but now I found, a little to my surprise, an *extraperitoneal rupture* of the bladder, behind the symphysis A Pesser catheter was put in

Meanwhile, I think I was justified in supposing that there was also a rupture of the urethra So, some days later, as he was getting better, I would make an incision to the supposed rupture But now, to my great surprise, I was able to introduce a catheter in the bladder! So at any rate there was no question of a *complete* rupture of the urethra, and nothing further was done

Now I can say the rest of it in a few words He got better quickly, August, 1927 *The wound is closed, he makes water freely He is out of bed and walks* tolerably well

To sum up briefly From the very beginning it was quite clear that the lad was suffering from a fracture of the pelvis

Then I supposed—and with good reason—that there was a complete rupture *of the urethra, that was not the case*

Further—and with tolerably good reasons—that there must be an intraperitoneal lesion, this lesion did not exist I think that the symptoms of "peritoneal irritation" were due to the subperitoneal extravasation of blood Many authors—also Danish authors—have laid stress upon this relation of course, and *many mistakes similar to my own have been made.*

Finally, we found what we did not expect to find—perhaps we ought to have expected it—an extraperitoneal rupture of the bladder

In spite of these diagnostical difficulties and mistakes, the final result was good—and all is well that ends well!

And now, Gentlemen, I give you my best thanks for the honor you have done to me in coming here, and for your attention in following these brief and simple and speedy demonstrations

THE CLINIC OF THE OTOGENOUS CEREBRAL ABSCESS ILLUSTRATED BY CASES AT THE RIGSHOSPITAL AND ST JOSEPH'S HOSPITAL, COPENHAGEN

By F NORSK, M D.

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By request of Professor Schmiegelow, the head of the otolaryngological departments of the Rigshospital and St Joseph's Hospital, I shall here produce the material from the above departments concerning otogenous cerebral abscesses

I shall make the statement as short as possible and here leave out the histories, which can only be tiresome, and for the rest refer to the printed record which is being published elsewhere, and where they will be included

I shall furthermore premise the remark that in the material I have only included those otogenous cerebral abscesses which have been positively ascertained by operation or by a post-mortem

At St Joseph's Hospital there have, in the years 1900–1925, inclusive, been altogether thirteen cases of otogenous cerebral abscess At the Rigshospital, in the years 1910–1925, inclusive, nineteen cases These cases, which amount to thirty-two altogether, will be treated collectively, and distribute themselves over the sexes as follows Nineteen men and thirteen women, or about 50 per cent. more men than women.

That men get otogenous cerebral abscesses so much more often than women is also shown by other statistics Blau has thus 240 men corresponding to 120 women

Of the thirty-two cerebral abscesses twenty-one were found in the cerebrum and eleven in the cerebellum *Abscesses of the cerebrum* in men in eleven cases, in women in ten cases *Abscesses of the cerebellum* in men in eight cases, in women in three

It is here seen that the surplus in the men is particularly due to abscesses of the cerebellum In Hammerschlag's, Blau's and Okada's statistics we find, in the case of abscesses of the cerebrum, as well as of the cerebellum, more than double as many men as women

My figures are of course too low to attach any particular importance to them statistically On operation were found Abscess cerebri in eighteen cases, abscess cerebelli in three cases On section were found Abscess cerebri in three cases, abscess cerebelli in eight cases

Thus in about two-thirds of the cases the abscess was found by operation

As regards age the following table will show the distribution

Age	Abscess cerebri	Abscess cerebelli
6–15	2	2
16–30	8	5
31–40	4	0
41–50	4	1
51–60	2	3
Over 60	1	0
	21	11

In two of the cases the cerebral abscess has occurred on the basis of an acute ear affection. Both cases in children Both cases abscess of the cerebellum

In three cases the ear affection was healed (Previously recorded by Dr Paul Henius)

In the remaining twenty-seven cases the cerebral abscess occurred in connection with chronic middle-ear suppurations, which had in by far the most cases existed for many years In eight cases a cholesteatoma of the middle ear is mentioned

That the cerebral abscesses are often accompanied by other intracranial complications is also proved by my material

Abscessus cerebri accompanied by Pachymeningitis external, in five cases, abscessus epiduralis, in six cases, meningitis purulenta, in eleven cases, abscessus subduralis, in one case

Abscessus cerebelli accompanied by Pachymeningitis external, in one case, abscessus epiduralis, in one case, thrombosis sin. transversus, in one case, meningitis purulenta, in four cases

In by far the preponderant number of cases the cerebral abscesses have been seated in the immediate neighborhood of the otitic tissue

In one case the situation of the abscess was not further described by the section, beyond the fact of its being in the cerebellar hemisphere of the diseased side In one case the abscess was on section

found situated quite medially in the cerebellum against medulla oblongata, and in one case an abscess was on section found in the frontal flap of the diseased side

As the sizes of the abscesses are given roughly and in various ways of designation a comparison is difficult. In by far the most cases they have, however, only been the size of a walnut, containing 1 to 2 tablespoonfuls of pus or so, altogether in eighteen cases In ten cases the size is not further indicated, and in four cases the abscess has contained from 50–200 c c of pus

The contents consisted in the preponderant number of cases of stinking pus In one case stinking pus intermingled with air In three cases inodorous pus

In the remainder of the cases (altogether eleven) the nature of the pus has not been more closely stated

As regards the contents of bacteria in the pus, the examinations on this point are rather incomplete, no trained bacteriologist being attached to the laboratories of the respective departments, and it having thus only in a minority of cases been ascertained whether there was growth of agar and bouillon, and whether the bacteria found were Gram-positive or Gram-negative

Bacteriological examinations of the contents of the abscess have been made in fourteen cases

No growth in two cases (aërobic + anaërobic cultivation)
Gram-positive cocci in three cases
Gram negative diplococci in two cases
Proteus in one case
Proteus + coli in two cases
Staphylococci + anaërobic air bred bacteria
Pneumococci (?) in one case
Streptococci in one case

I shall then proceed to mention the conditions of the cerebrospinal fluid, and first of these the conditions of pressure

As is well known, there was formerly a tendency to content one's-self by judging the amount of the pressure by the power and velocity of the effluence, and only in late years more systematic measurements of the pressure of the cerebrospinal fluid have been undertaken by means of a manometer At the Rigshospital and later on at St Joseph's Hospital Bouillitte's aneroid barometer has been used, and has as a rule worked satisfactorily In the measuring of

the pressure one must, however, a fact which Mr Robert Lund and others have called attention to, attach much importance to the patient's position, because, as shown by Quechenstedt, a compression of the jugular veins and consequent increased fillings of the veins of the cranium at once give rise to an increase in the pressure of the cerebrospinal fluid

This circumstance, having not formerly been sufficiently considered, the examinations of pressure must be judged very cautiously, as the patient's position in lying on his side with his head strongly inclined forward, so as to press the chin against his neck, is exactly one in which the jugular veins are likely to be compressed. In my material, examinations of the cerebrospinal fluid have been made in twenty-four of the cases, and of these examinations of pressure in ten cases, in several cases repeatedly As a rule a moderate increase of pressure has been found, at 3–4–500 mm. Only in one case an increase of pressure of 1200 mm. (number of cells 26,000/3—cured)

In one case only, the pressure has been normal (Pressure 200, no counting of cells—the fluid slightly opaque—mononuclear cells—no bacteria—cured)

As it will be seen I cannot from the above material draw any conclusions as to any definite relation between the pressure of the cerebrospinal fluid and the conditions of the cells in the otogenous cerebral abscess

Examination of the albumin of the cerebrospinal fluid has been undertaken in few of the cases only, and has not given when completed any information of importance.

As regards *the bacteriology of the cerebrospinal fluid* the same remarks as hold good of the contents of the abscess are applicable here If one is to decide the nature of the bacterium, experiments of cultivation must be undertaken on numerous nutritive substrata, also anaerobe, as well as fermentation experiments, and this has only been done a few times

In twenty-one of the cases experiments of cultivation from the cerebrospinal fluid have been undertaken. In thirteen cases no bacteria were found in the direct preparation, and no growth (agar, bouillon). In one case enterococci were found In one case Gram-positive cocci and in one case lanceolate diplococci

Increase of cells in the cerebrospinal fluid has been ascertained in seventeen cases, microscopically in two cases, and by counting of the cells of ten cases The normal number of cells was found in two cases In two cases the fluid is stated to be clear On the limit of the normal is case 13 with 9/3 cells

In eight cases no information as to the conditions of cells is given, partly because (as regards five of the cases) examination of the spinal fluid was not common at that time (before 1908), partly because it was not possible to get fluid by lumbar puncture, or the fluid was highly sanguinary

When next I proceed to mention the symptomatology of the cerebral abscess, I shall emphasize the difficulty in indicating definite symptoms as being characteristic of cerebral abscesses, especially as regards the otogenous cerebral abscess As also shown by me in my material, the otogenous cerebral abscess is extremely often accompanied by other intracranial complications, which in connection with the ear affection and possibly an accompanying labyrinthitis may give so effaced a picture that it is difficult to say whether the individual symptoms are due to the cerebral abscess or to the complications

As a general symptom, which constantly repeats itself in all my cases, the patient's worn condition is most characteristic Where the affection has continued for some time, the anorexy is noticed—the loss of appetite, the emaciation, which show that the patient is suffering from a very severe disease

In ten of the cases the very symptom anorexy is mentioned in the diaries But in far the greater number of cases we read between the lines that it has been present

The temperature has varied much in the different cases, and is difficult to judge on account of the frequently accompanying complications

"Slow cerebration" is generally considered to be characteristic of cerebral abscesses, and has in my diaries been given for eighteen of the patients Drowsiness is as often mentioned Towards the terminal stadium the drowsiness regularly increases, the patient becomes somnolent, often wandering, and finally unconscious

The patient's most frequent complaint is, however, a headache, which has been present in all my cases except two The seat of

the headache has most frequently been the diseased side, but not seldom more diffuse, sometimes appearing periodically

In fifteen cases the patient had vomitings, as a rule irrelevant, but nothing is said of vomitings of an explosive character, which have often been seen, for example, by Mr Michaelsen

Giddiness is mentioned only in four cases In three of these there was, however, a labyrinthitis which has probably been the cause

Ophthalmoscopy has been undertaken in twenty-nine of my cases, most often repeated times on each patient

Neuritis optica was found in twelve cases, and no changes of the pupils in the remaining seventeen

Of the twelve cases nine were abscesses of the cerebrum, three abscesses of the cerebellum, as it will be seen a relatively more frequent find in the former than in the latter (Altogether the material comprises twenty-one abscesses of the cerebrum, and eleven abscesses of the cerebellum)

Neuritis optica has in none of the cases exceeded two diopters, as a rule it has been of a slight degree with effacement of the papilla margin.

Finally must as symptoms of pressure be stated the slow pulse, which was found in thirteen cases of abscessus cerebri and two cases of abscessus cerebelli In two cases the conditions of the pulse have not been further indicated Focal symptoms have only seldom appeared in my thirty-two cases of cerebral abscesses, as I, as such, only give symptoms which have occurred before the opening of the abscess by operation

In three cases amnestic aphasia occurred, in the first case five days before admittance to the hospital, in the other cases during the stay at the hospital, after the middle ear had been opened, but before craniotomy had been undertaken In all three cases the seat of the abscess was the left temporal flap

In four of the cases of abscessus cerebelli focal symptoms were found In one case pronounced ataxy in the right upper and lower extremity in case of an abscess in the cerebellar hemisphere.

In case two there appeared after a suspended labyrinth function on the diseased side and after some time nystagmus on the sound

side, a nystagmus directed towards the diseased side, for which reason a cerebellar abscess was sought. It was not found, however On section a small abscess was found *in crus cerebelli ad pontem*

In one case a pronounced pointing to the left in the left shoulder-joint was found, a tendency to incline to the left independently of the main position.

On section an abscess of the size of a walnut was found in the front medial part of the left cerebellar hemisphere

Besides these seven cases of focal symptoms, there has in individual cases been established paresis of individual muscles, presumably more as features of the accompanying meningitis

As is known, the diagnosis of the otogenous cerebral abscess will often present considerable difficulties, and it will be particularly difficult to decide the seat of the abscess, in case no focal symptoms give definite indication.

I shall not in this place further discuss the diagnosis or especially the differential diagnosis of the otogenous cerebral abscess, but only call attention to circumstances which have in some of my cases led the operator on to the correct diagnosis

As a matter of fact, it will often be the case that besides the ear affection there are indications of an intracranial complication, and a cerebral abscess is suspected So an operation is performed, and the findings at the operation govern the further proceedings

In this respect we have often the support, that the otitic process leads to the point where the diseased dura or sinus further indicates the way

As I have mentioned above, cerebral abscess was found on operation in twenty-one of my cases In fourteen of these, changes of the dura of various degrees were found, so that apparently the abscess has easily been located In two of these cases there was furthermore a fistula in the dura right against the cerebral abscess.

In one case, which I have previously mentioned, it was a fact that a nystagmus towards the sound side, caused by a destruction of the labyrinth, rather suddenly changed towards the diseased side, which caused a cerebellar abscess to be sought

For the rest I must, as far as the individual cases are concerned, refer to the histories

The treatment in the two departments has been pretty much the same in all cases After information of the situation of the abscess has been gained by puncture, the dura has been incised, the cerebrum (or cerebellum) fissured and the abscess drained Next a kind of drainage has been installed, either gutta-percha or a rubber-drain A few times a washing out of the cavity of the abscess has been undertaken, and it has always been seen to that there was a good drainage by daily changing, dilatation of the edges of the wound, change of drain, and compress poultice treatment

The total result shows that of the thirty-two cerebral abscesses found in the two departments, partly by operation and partly by section, eight were cured by opening of the abscess and twenty-four died In one case the cause of the death was, however, pneumonia, as the cerebral abscess had been drained, and the patient's condition had improved, when a rapidly progressing bronchial pneumonia caused death in the course of one to two days and nights In the other cases death has presumably been mainly caused by the cerebral abscess or the accompanying intracranial complications, and roughly calculated we may then fix the mortality in this material at about 75 per cent

CLASSIFICATION AND INDICATION FOR SURGICAL TREATMENT OF GOITRE

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MANY different classifications of thyroid enlargements have been given by various writers, based upon more or less sound reason according to the viewpoint of the respective authors, and each serves some particular purpose, but in turn, no classification at present meets the ideal requirement of the clinician, the surgeon, and the pathologist. Until recent years there has existed so much confusion in the classification of goitre that there resulted a general disagreement among the profession concerning many phases of the subject, the basis of a rational, hence common, understanding was established only when Plummer demonstrated and clearly defined the difference between exophthalmic and toxic adenomatous goitre, the two varieties which comprise the vast majority of all thyroid diseases that constitute a menace to the health and life of the individual A correct diagnosis is fundamental to successful treatment, and the placing of all goitres in one of three general classes, simple, adenomatous, and exophthalmic, is perhaps the most satisfactory arrangement considered from the standpoint of giving effect to clinical workability Such a classification is easily remembered, and because of some predominating clinical or pathologic characteristic in one or another of these classes, may be placed practically every case, even though admittedly many cases will be a variation from or combination of two or even all three of these types

SIMPLE GOITRE

Simple goitre constitutes the majority of thyroid enlargements seen in adolescent patients Commonly noticed around the period of puberty, it differs from a normal thyroid in that there is an excessive deposit of colloid in the alveoli, often associated with this are adenomata, which in later life increase in size as the colloid component decreases Because of these facts, a simple goitre is frequently mentioned as a colloid or a colloid adenomatous goitre, according

to the ratio of the respective elements It is recognized by the symmetric enlargement of both lobes and isthmus, and the soft, smooth feel it gives to the examiner's touch Aside from its size and occasional tracheal pressure, it gives very little in the way of symptoms, although at times these patients will complain of nervous weakness and palpitation In some instances the nervousness is due to worry over the knowledge that a goitre exists In such cases there is not infrequently associated with the nervous symptoms a tachycardia which, if accompanied as it sometimes is with thrills and bruits, may strongly indicate the presence of exophthalmic goitre However, the differential diagnosis in this instance is particularly easy, for the basal metabolic rate in the simple goitre is always normal or slightly below, and there is no loss of weight, quadriceps weakness, or high pulse pressure

The colloid goitre usually disappears before the patient reaches twenty-five years of age, and is the only type that may be removed by iodine therapy Cases where this result is not attained, following the administration of iodine, indicate that there are small adenomatous growths, associated with the colloid, resulting in a colloid adenoma, and that although the colloid element has disappeared, the adenomatous component has been undiminished or perhaps increased The colloid goitre may be prevented, or, if developed, it may be cured by small doses of iodine As the incidence of this disease is by far the greatest during the school period of life, it has been suggested that the administration of iodine may each year correspond in period to the school term.

THYROID ADENOMATA

Adenomatous goitres, most frequent of all thyroid enlargements, are of two varieties, toxic and non-toxic Their size is variable, often being as large as a lemon, and occasionally equalling in size a large grapefruit Most of the enormous enlargements of the thyroid are of the adenomatous variety On palpation the growths are often felt to be irregular, as if made up of several round tumors Again they may have a uniform, smooth outline, for while adenomata are usually encysted, a diffuse adenomatosis is not uncommon, these cases having many areas of adenomatous hyperplasia without gross encapsulation. The adenomatous growths are more commonly found

in both lobes of the gland, but generally the lobes are not symmetrically enlarged, this is at variance with the colloid form In our experience we have more frequently found the right to be the larger of the two lobes These tumors are usually encapsulated, and as they increase in size their capsules increase in thickness to meet the requirements of the increased tension Although many probably begin in early life, the period of development is usually in the third, and the first half of the fourth decades, but it may be many years later before they give rise to constitutional or toxic symptoms

Degenerative changes are more frequent in this type, and particularly here do we find the hemorrhagic, the cystic, the calcareous and the malignant forms, the latter being relatively rare

It is not usual for the adenomatous goitre to produce early symptoms unless by reason of location it may cause pressure on the trachea There is seldom any increase in basal metabolic rate unless subjective symptoms are present, and we do not find these, as a rule, in patients under twenty-five to thirty years of age, which marks the period when the colloid element has largely disappeared and hyperthyroidism, due to the commencing toxicity of the adenoma, first begins to appear The toxic symptoms are not so intense as in the exophthalmic type, the development being more gradual, as a rule coming on after the goitre has been present for several years, and the body responds differently to the low-grade hyperfunction than it does to the sharp, sudden assault of the exophthalmic hyperthyroidism, but we find the tremor of the fingers, the warm and usually moist skin, especially of the palm of the hand, palpitation, and tachycardia, and gradual loss of weight, with an increase in the basal metabolic rate in 65 per cent to 75 per cent of cases The nervous system is but little affected as compared with the pronounced effects observed in the exophthalmic variety Exophthalmos is almost never present.

So insidious are they in development that these goitres may hyperfunction for a long period of time without being recognized, and ofttimes only when the symptoms arising from myocardial degeneration, such as dyspnœa and œdema, present themselves, does the patient seek the counsel of the physician. When this state is reached, the blood-pressure, which is otherwise always increased in such patients, will be found below normal.

In no class of goitre is there perhaps required a nicer balancing of judgment in advising proper treatment than in the adenomatous type The adenomata as a rule involve both lobes of the thyroid, commencing as they do in the early adult years, with the period of their full development, if we place that period as the time of first showing of toxic symptoms, attained in the period from late third to the early part of the fifth decades If operated upon before toxic symptoms are produced, it is possible that small adenomata which cannot be detected will be overlooked and remain as a potential source of development of toxicity This is more likely to obtain in cases not producing toxic symptoms, operated upon under the age of thirty After this period of life is attained, operative measures should be employed even though toxic symptoms have not developed, for no one can foretell which case is going to escape the development of hyperthyroidism with its risk of cardiovascular changes We can only say that the majority will eventually show degenerative changes, and in these cases of adenomata a thyroidectomy is a safer procedure than allowing the goitre to remain, thus subjecting the patient to the almost inevitable damage arising from hyperthyroidism

Where the damage is not too widespread, every case giving rise to toxic symptoms is surgical, for while valuable time may have been lost and the mortality risk raised, yet surgery offers the chance of the greatest restoration of health Even though showing marked cardiovascular changes, such cases, with proper preparation, and under local or combined local-gas-oxygen anæsthesia, may be successfully carried through their operative work. There is less pre-operative care possible in this class of cases, and they are never, in our judgment, cases for ligation or iodine therapy, although some writers claim beneficial results following pre-operative use of iodine

EXOPHTHALMIC GOITRE

Exophthalmic goitre has been known for centuries So accurately was it described by Graves and Basedow nearly one hundred years ago that it is still sometimes mentioned as Graves' or Basedow's disease

This form of thyroid disease usually develops between the ages of twenty-five and forty The majority of exophthalmic patients present themselves before the age of thirty-five, while the average case of adenomatous goitre comes for treatment after that age The

gland is usually symmetrically enlarged, smooth and round, but unlike the colloid form in that it is found on palpation to be distinctly hard The two types, however, present a still greater and more striking difference. The marked increase in the basal metabolic rate is wholly distinctive as a means of differentiation. The symptoms commonly come on rapidly, though in some instances their manifestation may be delayed for several months The development of toxic symptoms is rapid and may, unlike the rule in adenomatous goitre, begin before any appearance of thyroid enlargement The manifestation of exophthalmic goitre as emphasized by Plummer occurs in cycles Each cycle is made up of four periods First, development, second, maximum intensity, third, retrogression, and fourth, remission In some few cases the disease tends to pursue a chronic course without typical cycles or crisis The predominating symptoms are nervousness, loss of weight (although the appetite may be excessive), rapid action of the heart, tremor of the fingers, moist skin, sensation of warmth, fatigue upon slight exertion (particularly a quadriceps weakness noted upon stepping on a street car or climbing stairs), and marked nervousness, more frequently of a petulant, irritable type, and often, in the very toxic cases, gastrointestinal crises with nausea, vomiting and rise of temperature A thrill and bruit are present, and in most cases the arteries are palpable at the superior poles The blood-pressure is generally normal or below, but with pulse pressure high, differing in both of these respects from the findings in toxic adenomata Occasionally, developing cases of exophthalmic goitre, with the rise of temperature that is sometimes recorded, will be confused with early pulmonary tuberculosis, but the basal metabolic rate and Rontgen chest examination afford accurate differentiation between the two conditions In 95 per cent. of exophthalmic cases the basal metabolic rate is increased to above plus 30, and often as high as plus 90 or more, during the first and second stages of the crisis, and it has been observed to be at times increased before any clinical symptoms have developed or, at least, are noted by the patient The exophthalmic crisis is usually followed by a remission of months, or perhaps years, in duration, only to be repeated by similar cycles which eventually result in degenerative changes of the heart and kidneys

The treatment of exophthalmic goitre presents many problems for consideration, the number being determined largely by the list of complicating conditions found when the patient first comes for consultation Many cases improve and seemingly recover under medical treatment, although a careful check of these cases over a period of years will show many recurrences and a marked lowering of the percentage of the at-first-thought cures No one has been able to distinguish which cases will respond favorably to medical care and which will suffer irreparable damages to the vital organs Therefore a grave responsibility rests upon the clinician in advising medical treatment for the early exophthalmic, and a responsibility equally heavy is assumed by the surgeon in advising the time at which an operation may be safely performed At the present time the surgical treatment has reached a stage of perfection which subjects the patient to very small risk if he is properly prepared for operative procedure During the first period of the crisis these cases are dangerously serious risks, and thyroidectomy should not be performed until the crisis is past In the past few years there has been a revival of the iodine therapy accidentally discovered by Trousseau in Paris in 1863 However, before that, Roger of Palermo in the twelfth century prescribed the ashes of sea-weed for goitre Iodine by mouth will produce abrupt remission in most cases of exophthalmic goitre, but it has not been shown that this agency will control the disease permanently, and in some cases it gives no discernible effect After the administration of iodine is stopped, when it is given in the first period of the cycle, a rapid rise of the basal metabolic rate with toxic symptoms will often appear in one or two weeks However the period of improvement attained has been of sufficient length to afford opportunity for the necessary surgical work and at a greatly reduced risk, although it should be borne in mind that the influence of iodine is restricted in its scope and the danger of doing great damage through its use should be appreciated Many cases of inactive adenomata have undoubtedly been activated by the administration of iodine, and the widespread popularity of iodized salt is not without its possibilities for harm The results following the use of Lugol's solution in the exophthalmic type are frequently as striking as the best of those formerly obtained following the ligation of the superior thyroid pole, a procedure which is occasionally still to be employed In this con-

nection emphasis should be placed upon ligation of the entire structure, artery, vein, nerve, and lymphatics, for the ligation of the artery only shuts off the blood-supply to the gland through that particular vessel, while the additional ligation of the vein, nerve and lymphatics prevents the return of the venous blood by that route, blocks the nerve's impulses, and closes one of the portals of the lymphatic outlet The basal metabolic rate is an invaluable guide in determining the time of operation In its frequent determination we have an aid to or check on thyroid therapy unequalled by any other diagnostic agency Its value lies not in determining the basal metabolic rate at any particular time, but rather in establishing the important fact as to whether the rate of basal metabolism is in the ascendency or in the decline It is particularly dangerous to operate in a case of advancing basal metabolic rate It is far safer to operate upon a case with a plus 70 which has been a plus 80 but is falling, than it is to operate upon a case of plus 35 which is steadily rising and presenting no symptoms indicating that it has reached its maximum Only in the extreme cases, when all other attempts have failed to stay the destructive flood of thyroid toxæmia, should surgical interference be resorted to in the early stages of the crisis Even then the interference should be limited to ligation, under local anæsthesia, of the superior thyroid vessels of one lobe, this in ten to fifteen days should be followed by similar procedure of the opposite side, then after the patient has rested several months under hygienic control, a successful thyroidectomy may be performed

As a palliative treatment in some of the desperate cases, the use of deep X-ray and radium is to be considered, these have a few advocates who claim them to be agencies of choice and not of emergency Given the proper preparation of the case and a careful selection of the time of operation, the results from thyroidectomy depend to a very large degree upon the degenerative changes in the vital organs The most satisfactory results are obtained in patients operated upon early before the cardiovascular damage has occurred, for extensive organic damage is not repaired, and hence the restoration to health cannot be perfect Next in importance is the postoperative care of these advanced hyperthyroidism cases This may cover a period of months of careful nursing and freedom from worry,

care and anxiety If such care is not had, a neurotic condition may supervene, which will render the patient miserable to himself, and a trial to those upon whom he depends for care

SUMMARY

(1) The majority of goitres may be put in one of three classes Simple, adenomatous, and exophthalmic

(2) Simple goitres are not surgical, except in rare instances, and invariably respond to iodine treatment

(3) Adenomatous goitres develop in early life, but do not become toxic until a considerable period of years has elapsed

(4) Adenomatous goitres in people past thirty are surgical even if toxic symptoms have not appeared

(5) All adenomatous goitres which have developed hyperthyroidism are surgical if the degenerative changes in the vital organs will permit.

(6) Exophthalmic goitres are best treated surgically and before permanent damage has occurred, but there is great danger in operating during the period of onset, or that of the maximum intensity of the crisis

(7) Hyperthyroidism, whether adenomatous or exophthalmic in type, is a surgical disease, and operation must be early if permanent damage is to be prevented

(8) Basal metabolic rate determination must be frequently made in the exophthalmic cases, and in so doing the greatest aid to safety is utilized

(9) Pre-operative and post-operative care, the latter often covering a period of months, is vitally essential

Traumatic Surgery

A BALL SPLINT FOR HAND FRACTURES

By GEORGE G DAVIS, M D
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Fractures of the phalanges and of the metacarpal bones are numerous These fractures, especially the metacarpal fractures, if not cared for early and intelligently, cause considerable damage Some time ago the writer noted several metacarpal fractures that were poor results In some cases there was non-union which caused great disability and in others there was union in malposition which handicapped the use of the hand

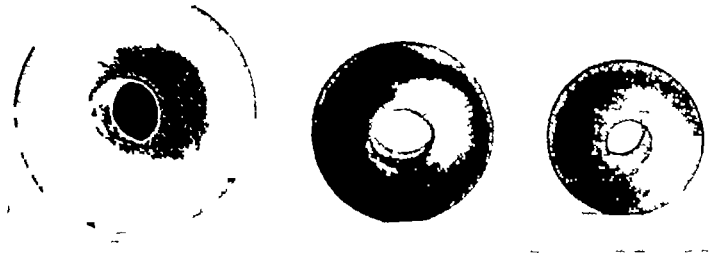
In caring for many fractures one is mindful of the necessity of ever having ready a splint for immediate use and many of them During the late war, the British had developed this to the highest art and the American forces were greatly benefited by, and quick to adopt, many of the British ever-ready fracture appliances.

There are many splints on the market now for fractures of the hand, but these as a rule are expensive and cumbersome and generally do not meet the anatomical and surgical requirements in the treatment of these fractures

The "ball splint" here described is really an outgrowth from the old treatment of dressing fractured metacarpals over a roller bandage The roller bandage is useful and adapted to the curve of the bones of the hand in its longitudinal axis but does not lend itself well to the lateral curve of the hand nor is one able to apply traction with it If one drops his hand to the side and looks at it, at once it is noted that the hand rests normally in semiflexion Also, there is a lateral curve of the hand as noted in the palm of the hand and one sees this lateral curve readily in an articulated skeleton

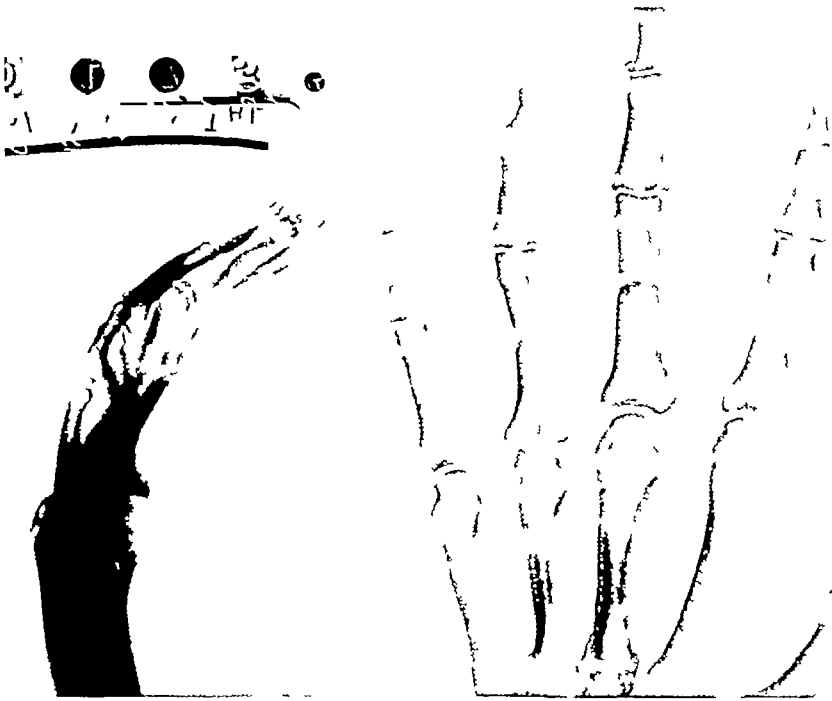
The ball splint conforms to the outline of the palmar surface of the bones of the hand It has also the advantage that traction may be applied with it in treating phalangeal or metacarpal fractures It is of wood and therefore cheap Again, one splint that will care for the treatment either of fractures of the fingers or metacarpals

Fig 1



Ball splint for fractures of the phalanges and metacarpal bones The largest of the three balls which is three and one-half inches in diameter is most serviceable especially in fractures of several digits The smaller splints are convenient in fractures of single digits (Reduced)

Fig 2

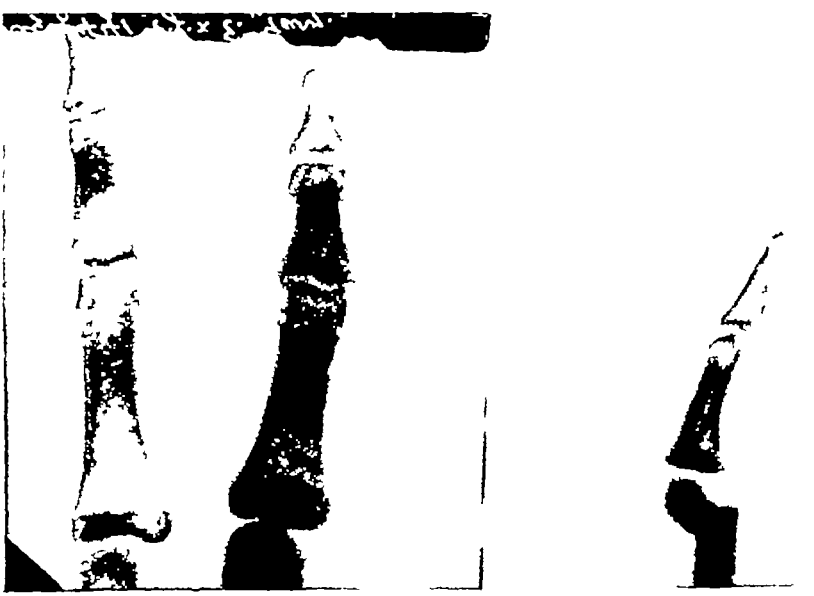


Case I —Fractures of proximal phalanges of middle and ring fingers with displacement

FIG 3.

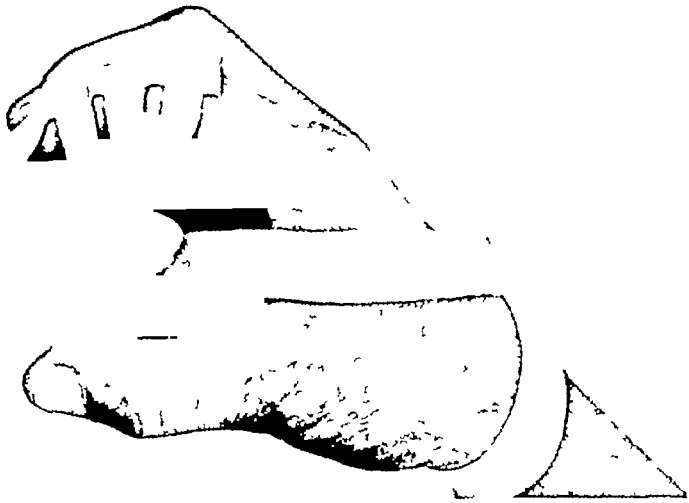
CASE I —After application of the ball splint The fractures are brought into excellent alignment and the wooden splint lends itself well to the X-ray

FIG 4



CASE II —Fracture of the proximal phalanx index finger with displacement before application of the splint

Fig 5



Case II —Application of the smaller ball splint for fracture of a single digit

Fig 6

Case II —X-ray examination after application of the smaller ball splint

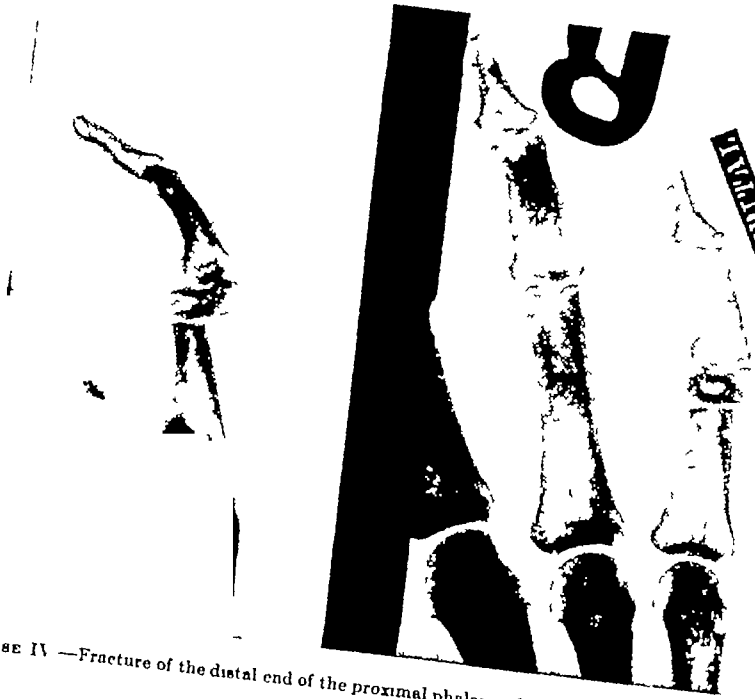
Fig 7

Case II —X-ray showing end result after removal of the ball splint

FIG 8.

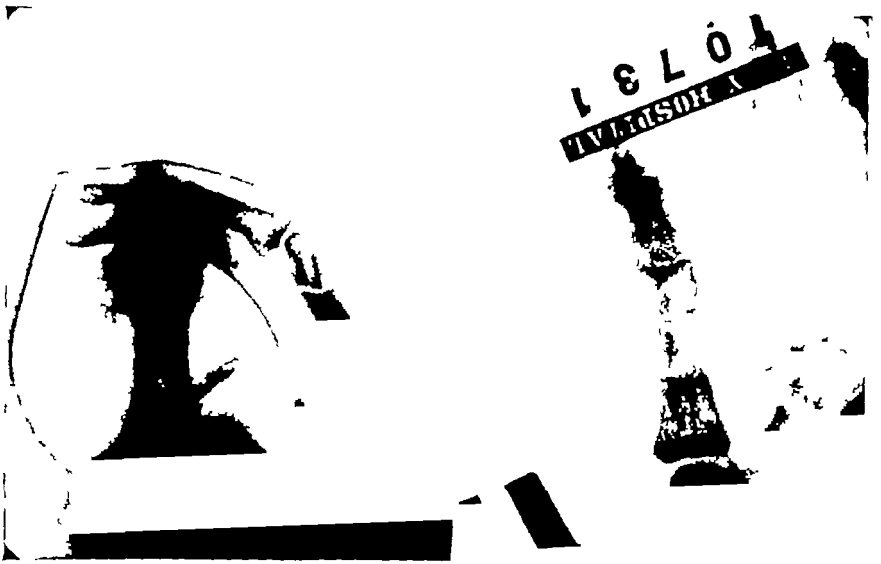
CASE III —Illustrates the application of the splint with traction in patient in which two digits ring and little fingers have been fractured The fractures are compounded and the proximal phalanges are involved

FIG 9



CASE IV —Fracture of the distal end of the proximal phalanx of the little finger before splinting

Fig 10



Case IV —X-ray after splinting of the little finger with the small ball splint

Fig 11

Case V —Fracture of proximal phalanx of middle finger with displacement

Fig 12

Case IV —X ray after splinting

Fig 13

Case VI —Fracture of the fourth and fifth metacarpal bones with overlapping displacement

Fig 14

Case VI —X ray after splinting over the ball with extension The overlapping has been corrected by extension and the alignment is good

or for both types of fractures, is a useful splint to have in the armamentarium of any dispensary or hospital This "ball splint" is nothing more than a sphere of wood with an inch perforation through its diameter for the passing of adhesive when anchoring the fingers for extension A three and one-half inch sphere has been found to be the most useful size, though smaller ones, two inches in diameter, are useful in cases where the fracture is limited to one bone and only one finger is to be splinted Then the involved finger with the thumb to oppose it and to hold the splint in place, are the only digits necessarily splinted The fact that the splint is of wood is obviously an advantage when X-ray examinations are made

In applying the splint, the finger which is fractured is first secured to the ball by adhesive so that extension may be made by pulling the hand about the ball Then the hand is firmly fixed by adhesive over the hand and through the hole in the splint. The accompanying illustrations (Figs 1–14) will show the principle of application more clearly and briefly than a written description

This splint has been a great convenience and found very efficient in the treatment of various types of phalangeal and metacarpal fractures

TREATMENT OF THE FRACTURES OF THE LONG BONES *

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DUE to the increasing number of traffic and industrial hazards a knowledge of the treatment of fractures is important to all physicians. Traffic accidents result in all physicians being required to render, at times, at least first aid The small country hospitals are bearing a larger burden of the traffic accidents—highway accidents often being of too serious a nature to allow transportation for any distance Because of the large number of traumatic conditions occurring yearly, they are deserving of more attention than more obscure lesions A large percentage of fractures occur between the ages of twenty and fifty years (wage-earning years), and the majority in men, thus interfering with the financial support of the family

A recent analysis of records at the Department of Labor of Michigan, Lansing, shows that from July 1, 1924, to July 1, 1925, there were 4386 fractures reported, which resulted in temporary, partial or total disability These fractures resulted in 348,089 days' loss of time Compensation paid was $695,489, medical expense, $117,681, resulting in a loss to the residents of Michigan of over three-fourths million dollars.

A more extensive analysis of the years 1916, 1917 and 1918 shows that there were 48,777 accidents resulting in disability, of which 9115, or 20 per cent, were fractures In Wayne County, which is largely Detroit, there occur about 1000 industrial accidents yearly, resulting in permanent partial or total disability A large percentage of these are the result of injury to the skeletal framework of the body

These statistics show the great importance from an economic as well as a humanitarian standpoint of the solution of the continuity of bone Another interesting point is that the total number of

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* Lecture to members of the European Assemblies of the Interstate Postgraduate Medical Associations of North America

fractures occurring in the industries in the state of Michigan, which are of sufficient importance to report, equals only a little over the number of fractures admitted to the Detroit Receiving Hospital It is thus evident that the majority of fractures occur as a result of civilian hazards and that they are of even more importance to the general surgeon than to the industrial surgeon.

With a few exceptions, such as os calcis and skull, the fractures of the long bone produce the greatest disability In these fractures, there is a strong muscle pull to overcome and immobilization is more difficult. There has been considerable discussion regarding the merits of open reduction and reduction by suspension and extension Experimental work, as well as analysis of the results of the various methods of treatment of fracture cases, indicates that open operation produces, on an average, greater disability and there has been a tendency on the part of surgeons treating a large number of fractures, to apply the principles of extension and suspension, either by skin or skeletal traction.

With the acceptance of these methods, there has followed a very interesting period of development which is described, as follows, by Colonel Pearson, of the South African Medical Corps, who early in the war was in charge of one of the large fracture hospitals in France and later in England

Prior to the war the results obtained in fracture work were a great source of worry to the traumatic surgeon The various procedures taught and applied were more or less standardized and the results in many cases were unsatisfactory In the pre war period, some surgeons were accustomed to regard the long Liston splint with perineal band as something Heaven sent toward the treatment of fractures of the femur Some regarded the Hodgen splint with considerable awe and frequently used it wrongly Some considered the double-incline plane for fracture of the lower third of the femur as the ideal Yet, because cases recovered with an inch or more of shortening, because they often got union in a deformed position, and because they so often had stiff joints, it was felt that there was a great deal more to be said on the treatment of fractures of the femur Some showed a desire to improve by having recourse to plating and evolved a technic requiring considerable skill in its application The results were good *in simple fractures*

Apart from open operation on the fracture, extension through adhesive plaster attached to the skin had gradually become the routine method, and yet we find evidence of a search for something better, for something to produce direct traction on the bone, in the evolution and use of the Steinman pin, transfixing the femur This pin had one disadvantage, among others, common to it and to the practice of plating It was restricted in its use and, as a rule,

was the prerequisite of the highly skilled surgeon For the majority of practi tioners the long Liston splint, with its attendant worries and dissatisfaction, was the usual implement.

With the first big offensive, both the French and English armies were snowed under with fractures The majority of these were compound, and due to the utter inability of the medical corps to cope with the situation, the frac ture mortality assumed alarming proportions In 1916, Colonel Gray, of the English Army, from statistics collected over part of the army area, estimated the total mortality of fractures of the femur at 80 per cent. The greater por tion of this occurred at the advanced stations Two years later, however, a different condition existed. Many surgeons, realizing that the methods were wrong, put untiring energy into the development of a routine in immediate treatment and later permanent treatment which would result in a lowered mortality and better functional result. The first change occurred at the battle of Arras, in April, 1917 Just previous to this offensive a large supply of Thomas splints had been distributed and men trained in their use The result of the use of traction methods, instead of merely fixation, in the transport of fractures immediately reduced the mortality of the femur cases of the various armies from the neighborhood of 50 per cent in 1916 to about 15 per cent in 1917

The second cause of this lowered mortality was the more efficient treatment of shock Stoves were provided in the advanced dressing stations at the earliest possible moment. The ambulances were also warmed by the hot air exhaust

In 1917, the surgeons of the various medical corps were organized into operating units As many units as were needed could be rushed to an offensive immediately The surgeons at this time were also learning the principles of early and complete débridement, followed by primary or delayed primary suture These two improvements in methods also helped greatly to reduce the mortality

The fourth advance in the treatment of fractures occurred when early in 1918 certain hospitals were designated as fracture hospitals

These highly specialized services aided largely in the improvement in treatment and in the development of the methods which are now available for the use of civilian surgeons It is this permanent treatment in which we are most interested. In some of these hospitals, there were as many as 300 to 500 frac tures of the femur Large series of fractures of the humerus and of the bones of the leg and of the forearm were also studied.

These various principles are applicable to the treatment of civilian fractures A fluoroscopic examination should be made immediately on admission and, if necessary, a stereoscopic X-ray examination The necessity of promptness is due to the need of determining, within the first few hours, the type of treatment to be followed. Early there is no fixed over-riding The large bones require the maximum pull at once Skeletal traction is the most efficient as it pulls directly on the bone It is also a good immobilizing agent, preventing angulation as well as over-riding Skin traction exerts a pull on the proximal fragments For example, skin

traction of the thigh exerts a pull on the proximal fragment through the fascia lata, the pull extending to the pelvic bones

The short muscles control the position of the upper fragments and the position of the distal fragment should be arranged accordingly

Skeletal traction should be tried before operation. If an operation will be necessary, operate early to avoid skin disturbance caused by blebs and skin infection. All joints should be flexed to relax the muscles Early operation causes less disturbance in bone repair Late operation is a contributing cause of delayed union. Fractures should be treated continuously until the position of the fragments is satisfactory Changes in position occur during the first twenty-four hours and, if necessary, the fractures should be X-rayed frequently and all necessary changes made during the first day

In all compound fractures, careful débridement should be done at once and extension applied. If the wound is badly contaminated, débridement should be followed by chemical sterilization with Dakin solution Tetanus antitoxin should be administered in all these cases The protection lasts for twelve days and the possibility of late tetanus should be kept in mind In the occasional case, in which gas gangrene develops, administer the *Bacillus welchii serum* This can be obtained from the Rockefellow Institute and elsewhere Treat fractures of the upper extremity in bed if necessary Do not think that because the lower extremities are normal that the patient should be allowed out of bed.

There should be 33½ per cent end-to-end approximation In children this is not so important The patient's life is more important than a good result and if there is marked shock or other complications, treatment of the fracture should be delayed Immediate traction often reduces the production of shock, even in fractured skulls of children, where perpendicular suspension is used, the elevation of the extremities having no effect upon the intracranial pressure A good functional result is better than a good anatomical result with poor function.

No primary reduction is necessary as the traction produces this reduction No anæsthesia is required except nitrous oxide, during the insertion of calipers Manual reduction and fixation under anæsthesia are rarely successful, especially in the femur Skeletal

traction results in less pain and less shock The circulation is better and thus union results more quickly If there are any wounds, they are easily dressed The joints to either side of the fracture are mobilized and the muscles are accessible for massage

After the type of fracture and the position of the upper fragment is determined, sufficient weight should be applied immediately to overcome the over-riding and angulation and the extremity suspended with the distal fragment in line with the proximal fragment A portable X-ray machine is a necessity

Because of the methods of treatment required, patients fall into four groups Children, up to six years of age, require only their own weight to produce traction. This is accomplished by the use of the Bryant frame From six to fourteen years of age, traction is required but the skin is so tender that adhesive straps are maintained in position only with difficulty It is our practice to insert calipers well above the epiphyseal line, the points being held in the bone by a fixation screw, which prevents slipping The bone tolerates the metal of calipers but there is more trauma to the soft tissues than in an adult's fracture The usual methods are followed in the adult group up to the age of forty-five years, at which time increasing care and gentleness are necessary and operation is to be undertaken only when absolutely necessary In the last group, location of the fracture line is usually different, the bone presenting points of greatest weakness near the joints

In estimating the final result the method of Moorhead is followed, which takes into consideration the union, function and contour —40 per cent is assigned to union, 40 per cent to function, 20 per cent to contour The percentage of each of these amounts present in a fracture equals the percentage of the end-result. Thus a fracture presenting 90 per cent normal union would equal 36, 80 per cent. of normal function would equal 32 and 100 per cent contour would equal 20, the total being 88 or 88 per cent of perfect result.

CONCLUSIONS

(1) In fractures of the long bones, skeletal traction is the method of choice. (2) Non-union rarely results (3) Open operation should be performed only after other methods have failed (4) Careful observation and records are essential to good treatment

THE USE OF PEDICLE GRAFTS IN TRAUMATIC SURGERY *

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THE surgery of trauma occupies a field as specialized as any, and its importance cannot be emphasized too strongly It not only entails the domain of surgery, but it spreads into economic restoration. An injury acquired in the line of industrial duty presents a manifold problem It involves the worker, his family, and indirectly the employer Adequate treatment, therefore, must restore the injured to work in the shortest possible time with the minimal or negligible amount of disability

There is no doubt that the past decade, and especially those years which have elapsed since the World War, have witnessed a marked *change in the attitude of industry to accident.* Mechanical improvements and protective devices on machines have eliminated many injuries, and workers have been educated to the "safety first" idea, so that more care is taken, with the inevitable result that the industrial hazard has been reduced But what is of paramount importance and of inestimable value, is that labor has been educated to the necessity of the immediate treatment of all wounds, no matter how insignificant, and now "first aid" is usually given at an efficient dressing station, or the patient is transferred to a hospital if the occasion demands

Much has been learned in the first aid treatment of accidental wounds The actual scrubbing of wounds with green soap and water, with massive irrigation with warm saline for twenty minutes or more, followed by a thorough washing with alcohol and ether, is far better than the reckless débridement of wounds, although the débridement is often indicated Most wounds of industry following this routine may be considered potentially sterile and be treated accordingly

It would be ideal if all these lacerations could be sutured and

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primary union ensue, but quite often the wounds incurred are accompanied by a superficial destruction of skin and a loss of substance Wounds of this nature, if treated conservatively and left to granulate, take months to heal It is absolutely necessary to diminish the period of industrial inactivity to the minimum, and to accomplish this any short cut to surgical convalescence is legitimate and must be taken. If skin avulsion is present and the wound does not permit suture, skin grafting should be employed without hesitation Primary skin grafting has not enjoyed the popularity which it deserves It has usually been relegated the surgery of secondary operations There is no reason why any sterile wound should not be covered with Thiersch or pinch grafts if necessary A surgical "scrub up" of wounds and a sensible débridement should render the wound sterile, and if infection follows subsequently, the worst complication is the death of the grafts But judgment must be used in the applications of Thiersch and Reverdin grafts Any area covered by a thin layer of epithelium will soon break down if subjected to constant friction, or undue stress or strain A chronic ulcer is a fearfully disabling injury, and in certain regions of the body these ulcers need more than epithelization for permanent cure—skin plus subcutaneous fat are absolutely necessary to restore a normal status

There has been much written of the Wolf full thickness graft, and it undoubtedly has a place in general surgery, but it has distinct limitations in traumatic injuries It does supply skin, but without subcutaneous tissue, and the chances of "take" are often too problematical The pedicle skin graft with an abundant and adequate supply of subcutaneous fat has a widespread application, and there is no doubt that it has proven an excellent and effective solution of many industrial wound problems It has disadvantages and advantages It involves a surgical procedure which often appears greater than a casual survey of the condition seems to demand It entails discomfort to the individual, and often a period of primary disability disproportionate to the injury, but its advantages lie in the guarantee that the end-results justify the extent of the operation, the discomfort, and even the time consumed

The indications for pedicle skin grafting are not so much the

extent of the injury, but rather its location. It is useful wherever a denuded area needs a skin and subcutaneous fat. It is ideal in finger and hand evulsions in which the skin of the finger or palm has been torn away completely, leaving the terminal phalanx or the tendons bare Some industrial surgeons would favor immediate amputations in these cases, but amputation is never an operation—it is always a mutilation, and in a woman, an amputated finger is a disagreeable deformity It may be argued that a graft on a finger is too bulky, and is apt to render the finger useless This is partially true, but the fault lies not with the procedure, but in the technic. The skin for grafting in these cases should be chosen from an area in which the subcutaneous fat is minimal The anterior abdominal wall, while quite convenient for the majority of grafts for the upper extremity, is apt to be too adipose for practical purposes The lateral chest wall lends itself much better for this purpose for here the skin is freely mobile, quite elastic, and the subcutaneous tissues not too fatty This region is almost ideal for grafts covering the fingers, palm and dorsum of the hand

There are really three essentials for any successful pedicle graft—an adequate blood-supply, absolute asepsis, and complete immobilization The adequate blood-supply refers not alone to that of the graft, but to the area to be covered, for unless the latter is healthy, no successful "take" can be expected If the case is a secondary one, the area to be grafted must be free of as much scar tissue as far as is possible, for the graft secures some of its nourishment from the periphery of the defect which it is intended to cover

Cases in which the area to be grafted is covered with sparse and unhealthy appearing granulations form an interesting group As a class they are most frequently found in ulcers occurring over bone. It is a waste of time to temporize in these cases The cortex of bone forming the base of the ulcer should be drilled in several areas and within a short time granulations will appear, arising from the medullary cavity This has been found quite practical in ulcers covering the patella and os calcis Leriche recently advocated periarterial sympathectomy to aid in the sterilization of granulations and the healing of leg ulcers In a recent case of refractory healing, in which all attempts at chemical sterilization failed (see page 202),

periarterial sympathectomy of the femoral seemed effective For, almost within twenty-four hours the granulations became healthier appearing, and in three days the area was ready for grafting However, one should not speculate too much on the result gained from one case

The graft should be selected not only from an area in which the subcutaneous tissue is sufficient, but also one to which the denuded part can be brought without difficulty and too great discomfort In cutting the graft, the base should be sufficiently broad and the long diameter should run parallel with the blood-supply wherever feasible. Its dimensions should measure about the size of the area to be covered, but it should be sufficient in length so that when it is sutured into place, no undue tension exists between the graft and the area of application. We have been in the habit of perforating the graft with small holes made with a Dakin pinch so that secretions might escape. However, many do not believe that this is essential

The modus operandi of the actual grafting is simple The area is thoroughly scrubbed with green soap and water, thoroughly irrigated with copious amounts of warm saline, washed with benzine, alcohol and ether, and then if granulations are present, the ulcer is curetted lightly Hot towels and pressure are applied to control the bleeding The graft is then sutured to the periphery of the wound with interrupted sutures of fine silk or preferably horse hair

It is absolutely necessary that a rigid asepsis be maintained In order to prevent the continual soiling of the wound with secretions which always prove an ideal culture medium for bacterial proliferation, it is advisable to cover all bare areas if this is practical When the graft has been cut and elevated, the underlying tissue should be completely covered with Thiersch grafts if it is impossible to close the defect after undermining the skin edges This cannot be emphasized too strongly For aside from preventing materially the constant secretion which would otherwise come from a raw area, it adds materially to the comfort of the patient, because dressings which are painful need be done less frequently In addition, it shortens the period of convalescence and diminishes the chances of scar-tissue formation. These Thiersch grafts should be covered with paraffin mesh, liberally supplied with sterile gauze, and the entire

dressing should be encased by sterile rubber dams If the graft must be carried for a distance, then the bridge of tissue connecting the area with the base of the pedicle may be folded upon itself so that it resembles a tube In this manner, only the smallest area of subcutaneous tissue is left exposed

Absolute immobilization is a *sine qua non* for any pedicle graft The Hawley fracture table with this end in view has been found very useful, for not only does it serve as a convenient operating table but is extremely helpful when a plaster spica is to be applied Every effort should be made to pad the cast liberally and properly so that comfort shall be maintained and pressure ulcers shall not result These patients after operation are inclined to be restless for the position is apt to cramp Morphine and other sedatives should be given freely

It is advisable not to dress the wounds until twelve or fourteen days have elapsed, unless clinical indications point to infections If the flap is viable, it may be divided usually at the end of two weeks After the pedicle has been severed, any bleeding vessels are caught, but the free end is not usually sutured into place for several days During this period, if there is any marginal gangrene, its extent can be estimated If the graft is completely viable, it is trimmed to fit and good firm pressure or sutures applied. If the flap in insufficient to cover the defect due to gangrene, pinch grafts are applied.

It is extremely important to warn these patients that the transplanted skin is without sensation, and that it may be months before it is restored For this reason, prosthetic apparatus should not be worn until sensation has completely returned

The following cases which are given in abstract are illustrative of the various indications for pedicle grafting It will be seen that they fall into two groups, primary cases in which the graft is done at the time of injury, or within a short time after it, and secondary pedicle grafts in which the patient has had a prolonged treatment with conservative measures, and is finally forced to submit to a secondary grafting operation. After all, secondary pedicle grafting is rather a reflection on the surgeon who first took care of the case, and in the future as the indications for primary pedicle grafts

become better known, the necessity for secondary operations of this nature will probably be greatly lessened

CASE I—J P, aged forty-one, hoisting engineer Admitted to the Surgical Service of Beekman Street Hospital June 20, 1927, and discharged August 24, 1927 On January 31, 1927, while the patient was working, a can of gasoline exploded, burning the face and arms He was treated at a hospital until about April 3d, when he came under the care of a private physician. At present, patient complains about the scars on the anterior portion of neck, which not only disfigure his appearance, but impair the free movement of his head

The past and family histories are irrelevant

The physical examination was negative with the exception of cicatricial contractures of the submental, hyoid, subhyoid, laryngeal, thyroid, suprasternal and submaxillary regions, which are better seen on the photographs than described. (Figs 1 and 2)

Operation—June 23, 1927 Under gas and oxygen anæsthesia, the scar which extended from the lower edge of the inferior border of the mandible down to the suprasternal notch was excised. A pedicle graft measuring about 17 cm in length and 10 cm in width was cut, running obliquely downward and inward, starting about 5 cm. from the clavicle and running downward just to the inner side of the left nipple. The graft was then turned upward upon itself so that it could be sutured into place around the periphery of the neck wound That portion of the graft which ran from the suprasternal notch to the base of the pedicle was "tubed" with interrupted silk. The defect caused by raising the graft was obliterated by means of a sliding graft from the axilla This was held in place by deep retention sutures and skin approximated by interrupted silk A stab wound was made in the left axilla for drainage A posterior moulded splint was made and head, neck and back were splinted in extension All the wounds were protected with vaseline gauze, and the graft itself was covered with Dakin gauze In order that graft would fit into the convexity of the neck, pressure was exerted by means of gauze placed over this area This was held in place by deep sutures taken through the graft into the neck, and tied over this gauze However, due probably to the pressure of the gauze, there was definite sloughing of the distal half of the pedicle flap, although the proximal half grew firmly into place.

July 23, 1927 The pedicle was divided through its base, the tube was opened and sutured into the submental area which had been left bare by the sloughing of the distal half of the original pedicle flap This graft healed in quite well and on August 24, 1927, patient was discharged with his wound completely healed When seen on December 10, 1927, patient's general condition was excellent, the motions of his neck had improved and the cosmetic result was quite good (Figs 3, 4, and 5)

CASE II—J C, laborer, admitted to the Beekman Street Hospital, Surgical Service, on January 21, 1927, discharged February 22, 1927

On October 28, 1926, patient caught both hands between steam pipe rollers and sustained third degree burns of both palms He was treated by local doctor for about three weeks, and when infection developed he was referred to a

Fig 1

Fig 2

Case I —Appearance before operation Lateral view (Fig 1) Full face (Fig 2)

Fig 3

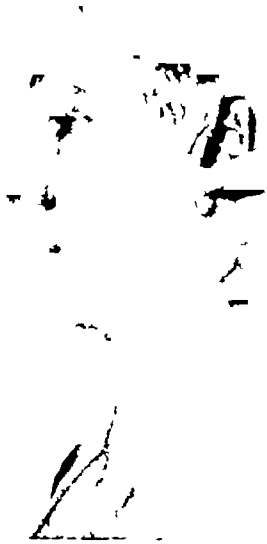
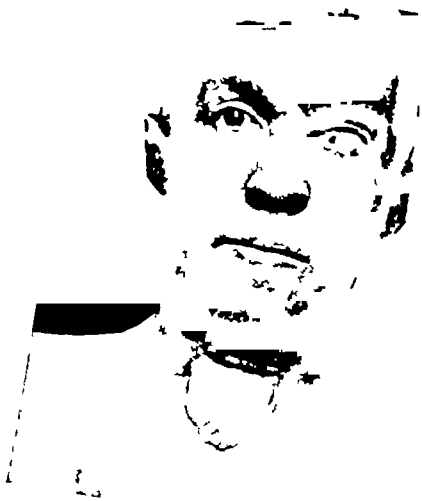


Fig 4

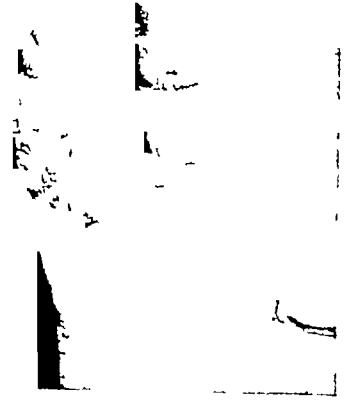
Case I —Appearance after operation Lateral view (Fig 3) Full face (Fig 4)

FIG 5



CASE I —Appearance after operation

Fig 6



Case IV —Appearance after operation showing fingers in extension

Fig 7

Case IV —Appearance after operation, showing finger in flexion

hospital where with Dakin's solution and baking, the wounds finally healed up, with marked contractures of all the fingers

The past and family histories are irrelevant

The physical examination was negative except for the surgical condition which disclosed that both hands were held in an attitude of complete flexion, really a claw hand In both palms there are dense scars which are red, and in places covered with dry crusts Extension of the fingers is practically nil and there is only slight flexion

Course—January 24, 1927 Under gas and oxygen anæsthesia, all the scar tissue of the right palm involving the deep fascia of the hand was excised Hot pads were placed over the palm until all the bleeding had been controlled A flap was then raised from the right axilla and the defect caused by raising this flap was covered by sliding the skin from the axilla The graft was then sutured to the periphery of the palm by interrupted silk and the part of the flap which was left bare was folded upon itself so as to make a tube. Wound dressed by Dakin gauze and hand held in position by a plaster-of Paris spica.

February 7, 1927 The case was removed, and under local anæsthesia pedicle was cut and was found viable except for a slight necrosis of the graft near the wrist The sutures were removed. The chest was dressed and sutures removed.

February 22, 1927 Wound is healed and patient is to be referred for physiotherapy

January 10, 1928 When last seen the graft was in good condition Sensation had returned, but due to inactivity on the patient's part, there are still definite contractures, although when operated patient was able to extend the fingers almost three-quarters of their natural degree of extension

CASE III—L. H, aged twenty five, stenographer Admitted to the Surgical Service of Beekman Street Hospital, February 21, 1927, and discharged March 28, 1927 While working, patient caught the fingers of his right hand in a moulding machine, sustaining a crushing injury to the second and third fingers

The past and family history did not bear upon the case.

The physical examination showed that all wounds were confined to the fingers of the right hand with the following distribution. (1) Thumb Severe crushing injury to the region of the distal phalanx, with partial avulsion of the nail No fracture. (2) Middle finger Multiple wounds with severe crushing of dorsal and volar surfaces of the distal half of the terminal phalanx. The nail has been avulsed and the terminal pad split vertically into four segments No fracture. (3) The fourth finger The distal half of the terminal phalanx presents a complete avulsion of the skin running just distal to the middle interphalangeal joint on its lateral aspect to an area about 5 cm beyond this point on the internal aspect and so around to the original starting point. The deep tissue structures are apparently intact The nail has been avulsed. X-ray examination disclosed no fracture

Course—Patient was taken to the operation room immediately upon admission, and under gas and oxygen anæsthesia, the wounds were irrigated very carefully with saline solution for about twenty minutes, then cleansed with

CASE VI—J W, aged twenty six years, lithographer Admitted to the Surgical Service of Beekman Street Hospital on June 4, 1926, and discharged July 22, 1926

While working on a paper-cutting machine, patient had his right hand caught in the gears, which resulted in an amputation of all the fingers

Past and family histories irrelevant

Physical examination was negative except for surgical condition, which disclosed the following The right hand had been cut off obliquely from the proximal portion of the proximal phalanx of the thumb through the mid portion of the second metacarpal and through the proximal phalanx of the little finger Röntgenographic examination of the right hand showed an amputation through the proximal portion of the proximal phalanx of the thumb, the mid portion of the second metacarpal, slightly more distal through the third metacarpal, through the head of the fourth metacarpal, and through the proximal phalanx of the fifth finger There is some fragmentation of bone about the first metacarpal phalangeal joint

Course—The patient was taken to the operating room and under gas and oxygen anæsthesia the wound was thoroughly irrigated with warm saline solution for about fifteen minutes, then cleansed with alcohol and ether, and a thorough débridement performed The ends of the second, third, and fourth metacarpals were removed, and ends of the bone rounded off The shattered remains of the proximal phalanx of the thumb were also removed The long flap of skin representing part of the little finger was cleaned, the bone fragments in it removed. The skin flap representing the little finger was laid across a part of the denuded area of the stump and sutured into place

An eight-inch longitudinal incision was then made in the abdominal wall down to the deep fascia at a point where the hand could rest comfortably The abdominal incision was undermined to form a pocket. The lateral edges of this incision were sutured to the deep fascia with interrupted silkworm-gut mattress sutures The stump was then placed into the pocket resting on a rubber dam which separated it from the muscles of the anterior abdominal wall and the mesial edge of the abdominal incision was sutured to the corresponding area on the dorsal surface of the hand This procedure completely covered the denuded surfaces of the stump Dakin gauze covered by dry dressing was placed about the wound and a plaster spica applied so that the arm and forearm were completely immobilized

June 17, 1926 Under general anæsthesia, the cast was removed and pedicle graft which was completely viable was divided from its abdominal attachment and sutured to the proper place on the palmar surface of the hand

Following this procedure, patient ran rather a stormy course, due to the fact that there was infection in the region of the pronator quadratus muscle of the forearm, and an acute arthritis of the sternoclavicular joint Both of these surgical conditions yielded to incision and drainage and patient was discharged on July 22, 1926, with the abdominal pedicle flap plentifully supplied with subcutaneous fat covering completely the exposed ends of the metacarpals He was then advised to go home, to be readmitted subsequently for a digitalization of his thumb

Second Admission for Phalangealization of the Thumb—The patient was readmitted September 7, 1926, and discharged September 17, 1926

The general condition of the patient had greatly improved and he had gained about twenty five pounds in weight Locally, the stump was well covered by the thick pedicle graft.

September 7, 1926 Under general anæsthesia a typical phalangealization of the thumb was performed The wound healed by primary union and patient was discharged, being requested to return for baking and massage of the metacarpal of the thumb

Follow-up—October 20, 1926 There is quite some power in approximating and abducting the thumb to the palm of the hand and abduction seems excellent

January 2, 1927 Patient has been fitted with an artificial hand with a movable thumb attachment so that by fitting the thumb over the newly made phalanx, he is able to grasp objects and use the hand in this way (Figs 8, 9, and 10)

CASE VII—J R, aged thirty-eight years, male, occupation, coal passer, was admitted to the Surgical Service of the Beekman Street Hospital on June 25, 1927, and discharged September 1, 1927 On the day of admission, patient caught his right arm in a revolving machinery belt, and right forearm was torn off at the elbow The patient was admitted in moderate shock.

The physical examination was negative except for local condition There was a clean disarticulation at the right elbow About four inches of the humerus protruded below the muscles The skin and deep fascia were torn off in a clean circle at about the level of the lower fourth of the arm All of the exposed muscles were mascerated and shredded

Patient's condition improved under supportive shock treatment, and operation was performed about seven hours later

Course—Operator, Doctor Lowry Under gas and oxygen anæsthesia, the loose torn fragments of muscle were excised The brachial artery and vein were ligated. The nerves were pulled down and injected with 95 per cent. alcohol and the distal portions excised The muscles were approximated over the end of the humerus with mattress sutures Figure-of-eight tension sutures of heavy silk were inserted through the free edge of the skin and fasciæ and tied under moderate tension around the lower end of the humerus By this manœuvre about one half of the surface of the arm was covered with skin About three inches of the lower end of the humerus was left exposed. Wet dressings were applied

July 1st Stump shows no gross infection Dakin irrigation and dichloramine T dressings

July 5th Abduction of shoulder begun

July 12th Granulations appear clean Ready for revision of stump

July 13th Operation under gas and oxygen anæsthesia. The traction sutures were removed. The distal five inches of the humerus was excised. The exposed muscles and granulation tissue were sutured over end of bone with chromic catgut. The edges of skin and fascia were drawn down and sutured to the muscles with the same material, leaving about the distal 7 5 cm of muscle uncovered. Wet dressing

July 20th Granulations appear clean End of bone well covered. Skin edge well adherent to underlying tissues Dakin irrigation and dichloramine T dressings instituted Abduction of the shoulder re-instituted

August 2nd Granulating end of stump quite clean and healthy Skin margin healthy Pedicle graft advised

August 3rd Operator, Doctor Lowry Pedicle graft to stump of humerus Skin margins squared off Redundant granulations curetted Hot towels applied to oozing area A pedicle flap was raised from the antero-lateral surface of the right chest about 10 × 25 cm The wound in the chest wall was closed with interrupted silk sutures after undermining the edges The flap was applied and wrapped around the granulating area on the right arm with interrupted silk sutures The edges of the pedicle were approximated by sutures Interrupted deep silk retention sutures were placed through the surface of the flap into the granulating area of the arm Dakin mesh and light gauze dressing were applied. A circular plaster cast was applied to the arm and body

August 6th Apparently about three-quarters of the graft is in excellent condition Tip of the flap lying on the part of the arm next to the chest wall is apparently not viable Adhesive dressing

Plaster removed because of extreme discomfort. All of the graft except the extreme tip was viable Dry dressing reinforced by adhesive to take the strain off of pedicle Patient much more comfortable

August 11th A number of the sutures and small gangrenous tip of the flap removed Dry and adhesive dressing

August 17th Entire remaining portion of graft viable Remaining sutures removed

August 18th Under gas and oxygen anæsthesia, the pedicle graft was divided, and trimmed to fit the granulating area on the postero internal aspect of the arm from which the tip of the flap had sloughed Graft held in place with interrupted silk sutures Base of pedicle trimmed and sutured down to chest wall with interrupted silk Dakin mesh and dry dressing gauze applied.

August 24th Graft entirely viable over whole end of arm Allowed out of bed Wound on chest healing Abduction of shoulder re instituted

August 31st Graft in excellent condition Wound healing Sutures removed

September 1st Discharged O P D for dressings and physiotherapy

October 20th Wounds all healed. There is considerable contracture of the chest scars which are being loosened up by massage Abduction to 45 degrees at the shoulder Considerable pain persists

November 20th Active abduction to 60 degrees Passive abduction to 70 degrees Pain persists particularly in cold weather

January 1st Active abduction to 70 degrees, passive abduction to 80 degrees The end of the stump is slightly tender Grafted area anæsthetic. It is planned to withhold the application of an artificial arm until the nerve supply has returned in the grafted area. (Figs 11 and 12)

CASE VIII.—S D , aged twenty-seven, male barber Admitted to the Surgical Service of the Beekman Street Hospital on June 19, 1927, and discharged August 18, 1927

In 1917 while serving in the Italian Army, the patient suffered from pain and swelling of left patella region A warm oily substance was injected in the pre patella region for these complaints His discomfort soon disappeared following this procedure, but a firm, hard area persisted at the site of injection One month previous to the present admission, patient fell, striking the left knee, an ulcer resulting, which rapidly became larger and deeper

Fig 8

Case VI —Condition after phalangealization of thumb

Fig 9

Case VI —Showing artificial hand with thumb abduction

Fig 10

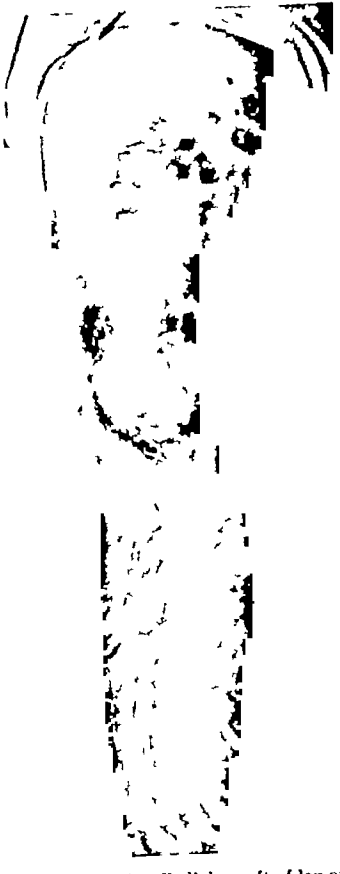
Case VI —Showing artificial hand with thumb in adduction

Fig 11

Case VII —Condition after operation (Front view)

Fig 12

Case VII —Condition after operation (latero posterior view)



Case VIII —Pedicle graft of leg on extension

Fig 11

Case VIII —Showing pedicle graft with leg in flexion

Local examination revealed a hard, fibrous mass, involving the entire anterior surface of the left patella region, with a central ulceration extending down almost through the entire thickness of the mass This mass was evidently a paraffinoma.

Course—June 20, 1927 Operator, Dr J Worcester Under gas and oxygen anæsthesia, the mass was excised by Doctor Worcester The skin edges were anchored to the underlying tissues with silkworm gut, allowing a free, granulating surface, approximately the size of the paraffinoma. This area was then dressed daily until considered surgically clean

July 15, 1927 Operation by Doctor Mage Pedicle graft from right calf to left patella region The patient was placed on a Hawley table The granulating patella area was thoroughly cleansed with soap and water, alcohol and ether Bleeding was controlled by hot towels A full thickness pedicle flap was cut from the posterior region of the right leg with its base 5 cm below the popliteal space crease The flap measured 15 cm wide and 15 cm long The exposed muscle resulting from lifting the pedicle flap was immediately covered by Thiersch grafts removed from the anterior surface of the right thigh These grafts were covered by paraffin mesh and gauze dressings, over which a rubber dam was applied The posterior aspect of the right leg was brought over the anterior aspect of the left knee The graft edges were sutured to the edges of the granulating wound by interrupted silk. As the tension seemed a little too great, the distal edge of the flap was allowed to slip, by removing two sutures so that 90 per cent. of the granulating area was covered. The position was maintained by a plaster spica, with a window cut for the inspection of the wound

July 24, 1927 Nine days after the operation the wound was inspected The flap was viable and covered 75 per cent. of the granulating area. Some slipping of the flap had taken place, due to the freeing of the distal edge The exposed granulating area was immediately pinch grafted, with the hope of having the wound completely epithelized when the time came to divide the pedicle

July 29, 1927 The graft which was viable was divided under local novocain anæsthesia The distal edge bled freely The pinch grafts had taken completely so the entire patella region was covered by skin and subcutaneous tissue. The plaster cast was removed and the Thiersch grafted area on the posterior aspect of right leg inspected for the first time All grafts were found to have taken Patient discharged August 18, 1927, with wound completely healed. There was no limitation of function at the knee

Second Admission—Patient was readmitted November 29, 1927, because the lower edge of the grafted pedicle flap was redundant

Under local anæsthesia, the redundant skin of the flap was cut away and exact skin approximation made The wound healed promptly after slight superficial infection Discharged October 15, 1927

Follow up—December 1, 1927 The patella region is completely healed There is complete flexion and extension of knee Patient is doing his usual work and has no complaints (Figs 13 and 14)

CASE IX—F M, school boy, aged ten Admitted to the Surgical Service of Beekman Street Hospital on October 2, 1925

Four years before admission patient skinned his left knee while riding in

a moving elevator He had been grafted several times at various hospitals, but the wound over the patella always reopened

The past and family histories are irrelevant

The physical examination was negative except for a scar over the left knee on its anterior aspect, covering an area 7 5 cm above and 5 cm below the patella Over the patella there is a wound Along the right side of the knee joint is a scar There is some interference in flexion of the joint, but extension is practically normal

Course—October 19, 1925 Under gas and oxygen anæsthesia, the fibrous scar tissue over the patella was curetted away, six small holes were drilled into the anterior surface of the patella There was moderate bleeding Vaseline gauze dressing was applied and the joint immobilized

November 10, 1925 The granulations appeared healthier, so pinch grafts were applied to the uncovered patella.

November 20, 1925 The pinch grafts which were applied ten days ago have entirely disappeared, and wound is practically the same as it was when patient was admitted, except that there are more exuberant granulations

November 25, 1925 Patient discharged against advice, still having the ulcer over the patella

Second Admission.—December 3, 1925 Patient readmitted for another attempt to heal ulcer of the knee Granulations are flush with the edges of the epithelium and the ulcer measures approximately 3 5 cm × 2 5 cm There is practically no discharge There is considerable redness of the tissues immediately around the ulcer as if there were some low grade cellulitis Attempt will be made to overcome the cellulitis and then the edges of the wound will be undermined and wound sutured Whether this procedure will be satisfactory or not is problematical

December 5, 1925 Inasmuch as the condition has not subsided with wet dressings, it has been deemed advisable to treat this ulcer conservatively for some period of time

Third Admission—October 23, 1926 Since the patient's discharge from the hospital he has been observed from time to time in the dispensary, and the ulcer over the left patella has been healed occasionally for a short time At present, however, there is an ulcerated area, 2 5 cm in diameter, which is apparently where the skin graft was done while in the hospital Patient has complete function of the knee joint. The skin over the front of the knee joint appears to be in fairly good condition except where ulcer is apparently due to continuance of tension where he bends knee Patient is readmitted for a pedicle graft.

November 6, 1926 Under gas and oxygen anæsthesia, the ulcer of the knee was débrided and the patella drilled again, with the idea of stimulating granulations

November 15, 1926 Granulations are certainly growing very slow and their appearance is pale and unhealthy Dakin's solution has been applied without result

Operation—November 29, 1926 Periarterial sympathectomy of the femoral vessel Three-and a half inch incision was made over the femoral artery just below Poupart's ligament, vessel was dislocated from its sheath, the adventitia stripped from the vessels from Poupart's to the giving off of the profunda

During the course of this procedure the vessel was seen to contract, but not to dilate No change noted in the color or circulation of the foot

November 30, 1926 Granulations appear better There is practically no change noted in the temperature or circulation of the foot

December 1, 1926 Granulations appear healthier, red in color and are bleeding freely

December 3, 1926 Progressive improvement in granulation

December 5, 1926 Granulations have improved so much that a pedicle graft, which was formerly impossible, is now practical

Operation—December 6, 1926 Pedicle graft to left knee from right calf Under gas and oxygen, the granulations of the left knee were carefully cleansed with green soap and water, alcohol and ether Granulations were then curetted Flap was cut from the right calf to form the pattern of the defect of the left knee After this flap had been raised, the underlying tissues were covered with Thiersch grafts taken from the anterior aspect of the right thigh These grafts were covered with Dakin gauze and rubber dam. The right calf was brought over the left knee in such a position so that the pedicle graft could be sutured over the patella with interrupted silk sutures, prior to which the graft was perforated with a Dakin punch A plaster spica was applied on the Hawley table so as to render the parts immobile

December 21, 1926 Under gas and oxygen anæsthesia, pedicle graft, which was completely viable, was severed. The graft was not sutured but was strapped into place There is some retraction of the graft at the upper margin which forms a slight ulcer

February 12, 1927 Patient discharged to the Out-patient Department.

Patient was seen subsequently, last time, December 18, 1927, at which time the wound had completely healed, the pedicle graft was functioning well, sensation was evident, and patient had secured a satisfactory result (Fig 15)

CASE X.—C G , aged thirty five years, male, a porter, was admitted to the Surgical Service of the Beekman Street Hospital, November 8, 1925, and discharged January 6, 1926

While attempting to stop an elevator, he missed the rope and his right heel was caught and crushed between the floor of the moving elevator and the floor of the building An ambulance brought him to the hospital immediately after the injury The past and family histories were not relevant Physical examination was negative except for a surgical condition which disclosed an obliquely lacerated wound about 4 inches long, resulting in a partial avulsion of the right heel down to the Achilles tendon. Röntgen examination showed an incomplete fracture of the os calcis of the right heel without displacement.

Course—The patient was removed to the operating room immediately upon admission and the wound thoroughly irrigated with saline solution for about fifteen minutes, then cleansed with alcohol and ether A thorough débridement was then performed. The laceration was sutured with silkworm gut and silk, and the wound dressed with vaseline gauze

November 12th The wound had apparently healed without infection but the lower flap of skin covering an area of about 2 by 3 inches had become black and gangrenous

November 19th The necrosis of skin over the heel had extended so that

an area of about 3 by 5 inches was involved. The underlying granulations in areas, however, were fairly clean and the os calcis was visible

December 8th The wound had cleared up very satisfactorily Granulations were healthy and exuberant, and the condition seemed satisfactory for a pedicle graft.

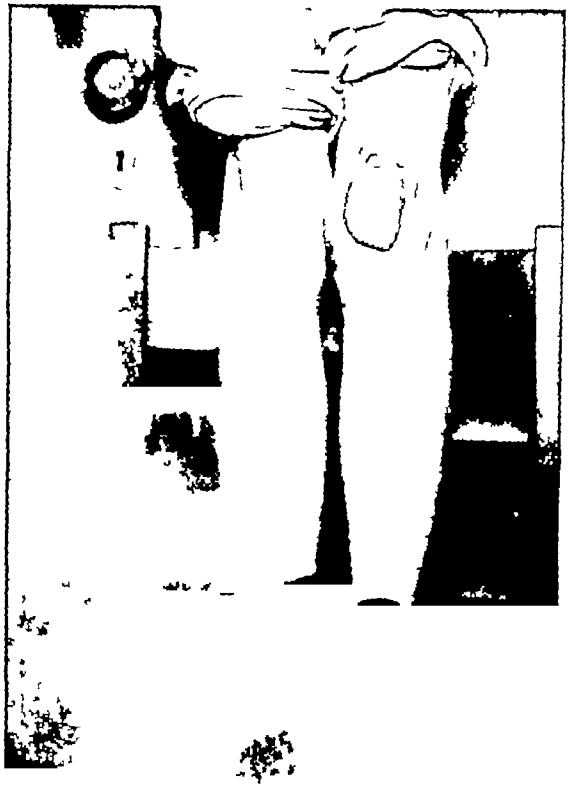
Operation—December 10th Pedicle graft from anterior aspect of left thigh to right heel The patient was placed and fixed upon a Hawley table The area of the right heel was thoroughly cleansed and scrubbed vigorously with green soap and water followed by alcohol and ether Since this procedure caused bleeding, the weeping area was covered with a hot towel and pressure applied by the hand of an assistant. A full thickness pedicle graft was cut in the region of the anterior aspect of the upper third of the left thigh, measuring about 3 inches in width and about 5 inches in length The base of the graft ran parallel to Poupart's ligament The thickness of the graft included all tissues between the skin and the deep fascia of the thigh The muscular surface which had been left bare by raising the pedicle was carefully covered with Thiersch skin grafts which had been removed from the anterior aspect of the right thigh These grafts were covered with paraffin gauze and gauze dressings, over which a rubber dam was applied The right heel was then brought up to the anterior aspect of the left thigh and the periphery of the graft was sutured to the periphery of the wound of the heel for about 200 degrees of its extent with interrupted silkworm-gut sutures. Two sutures were passed parallel to the long axis of the graft through it and the heel so that the graft was firmly attached to the underlying granulations covering the posterior aspect of the os calcis *In order to permit secretions to escape through the graft it was perforated in* several places with a Dakin punch The parts involved were then rendered immobile by a plaster spica which completely encased the lower half of the body The area of the graft was simply covered with paraffin gauze overlaid with a sterile towel so that inspections could be made without removing cumber some dressings.

December 12th The graft was completely viable Under novocain anæs thesia the pedicle which was firmly attached was incised for a distant of about one inch on each side at its base There was free bleeding from the distal segment.

December 23rd Under novocain anæsthesia, the pedicle was entirely divided and the free portion of the flap was sutured to the remaining free skin edge of the heel with interrupted silkworm gut The plaster cast was removed and the area covered by the Thiersch grafts was dressing for the first time It was found that all the grafts had taken The patient was discharged January 5, 1926, with the heel completely healed He was last seen June 23, 1926, was able to walk perfectly, and the heel was still completely healed. (Fig 16)

Case XI—H C, aged seventeen years, male, occupation, handyman, was admitted to the Surgical Service of the Beekman Street Hospital, March 26, 1926, and discharged July 3, 1926 Fourteen months before admission the right heel had been crushed between the street and the platform of a moving elevator The patient was removed to a hospital where he received conservative treatment, rest in bed, and the local application of wet dressings In spite of the fact that the wound, which involved practically the entire heel, contracted down to

Fig 1o

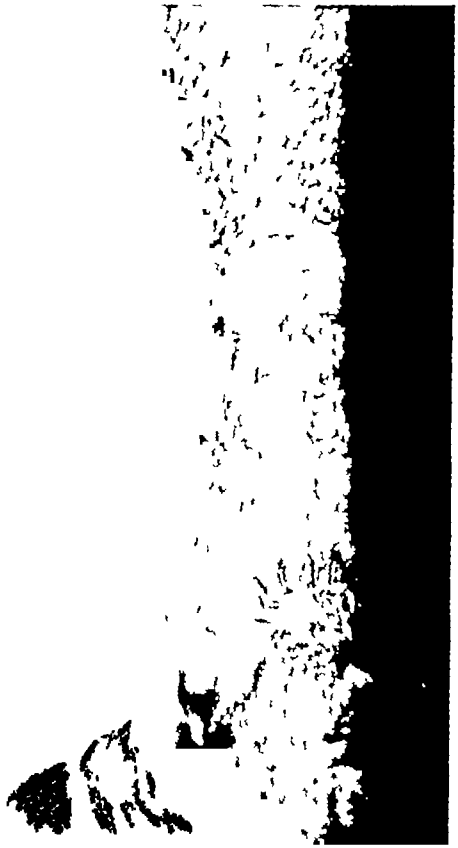


Case IX.—Condition after operation

Fig 16

Case X —Pedicle graft to heel

Fig 17

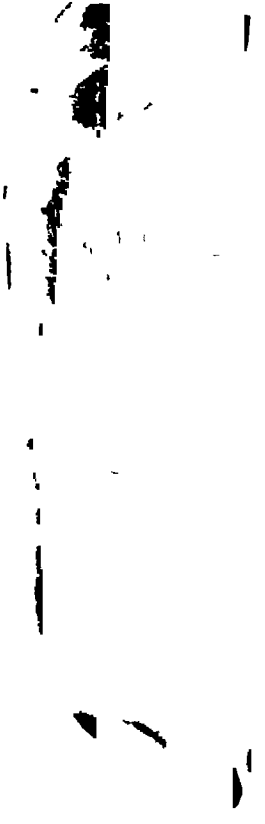


Case XI —Pedicle graft to heel

Fig 18

Case XII —Granulating ulcer of heel after excision of scar tissue

Fig 19



Case XII —Showing pedicle graft healed into place

Fig 20

Case XII —Showing Thiersch grafted area from which pedicle graft was taken

about the size of a fifty-cent piece, a chronic ulcer remained, and it was necessary for the patient to be dressed about three times a week Because of this condition, he was unable to secure employment

Physical examination was negative except for the surgical condition. The entire heel was a mass of scar tissue except for a granulating area about the size of a fifty cent piece on the posterior medial aspect of the right heel The granulations were pale and sickly in appearance The os calcis seemingly lay beneath the scar tissue and the granulating area There was a deformity of the foot from a contracture of the flexor of the leg resulting in apparent talipes equinus

Röntgen examination of the foot showed an old complete fracture of the os calcis about midway through its body This had now healed with the posterior fragment turned markedly to the inner side, and, that it was a comminuted fracture was indicated by a hole through the outer side of the bone There was a rather large deforming callus present.

Course—April 3rd Part of the scar tissue about the heel was excised and about a dozen holes were drilled into the os calcis with the hope that granulations might spring up from the medulla covering the cortex with healthy granulations The leg was placed in a plaster cast with the foot in complete dorsiflexion.

April 13th The wound was clean and granulations were flourishing and were beginning to cover in the wound There was still much scar tissue surrounding the area of the granulations and this would have to be removed before any attempt at pedicle grafting was made

April 28th All scar tissue was removed and another dozen holes drilled into the os calcis

May 7th An area about 5 by 3 inches was covered in parts with healthy granulations

May 10th The wound was thoroughly cleansed with green soap and water, and ten more holes were drilled into the os calcis

An X-ray picture of the heel at this time did not disclose any infective osteomyelitis

May 16th The entire heel was covered with granulations of healthy appearance The cast was removed

Operation—May 17th A pedicle graft from the anterior aspect of the left thigh was attached to the right heel for a large ulcer involving the posterior portion of the heel extending from its inferior margin upward on the Achilles tendon for the extent of 5 inches The transverse diameter of this was about 3 inches The technic of this operation was identical with that employed in Case X.

May 23rd The pedicled graft was completely divided The area which had been covered with Thiersch grafts was dressed and it was found that all the grafts apparently had taken

June 1st The pedicled graft which had been left free was now sutured in place with interrupted silkworm gut sutures Following this there was some sloughing in the superior part of the grafts, which on June 17th was covered with five small pinch grafts

July 3rd The patient was discharged.

The normal blood-supply being a first essential of normal functioning of organs, its disturbance will create symptoms due to decrease of function where it is lessened, or the reverse where increased, hence headaches, vertigo, fainting, aphasia, etc, all can be expressive of vasodilator or vasoconstrictor excess in the cerebral vessels, just the same as flushing or blanching of the face, and they not rarely go together With this vicious circle the innervation of the heart and other vital organs may be secondary, thus disarranging their functions

Half a century or so ago S Weir Mitchell reported about half a dozen cases of vertigo from eye stress, and at that the matter has rested, with only a few added contributions since, leaving the impression that vertigo from the eyes is a rarity I wish to state my belief, that except for the relatively small number from basal brain tumor or inflammation of the labyrinth, the eye stress is an important factor in a large percentage of persistent vertigo supposedly due to high or low pressure, old age, gastric disorders, etc. It has fallen to my lot to see hundreds relieved when these conditions were supposed to be the insuperable causes, and yet the patients were relieved of their vertigo, and the blood-pressure remained high or low as before, and the age did not diminish, but due to the improvement of nutrition it is no uncommon thing for patients to apparently grow younger instead of older for several years to come

The chronic gassing stomach so often present is almost invariably relieved and frequently cured, in spite of an existence of from a few months to several decades If asked the most important reasons for eliminating eye stress, I should say headaches before the normal age for glasses, about forty-five, and vertigo and gassing stomach for the next forty-five, or practically to the end of life

In children malnutrition and lack of growth is not rare, also frequent vomiting, and I have seen instances where in the language of their parents they "grew like weeds," or ate and fattened like pigs, after correcting eye stress, where tonics and medical treatment, removal of tonsils and adenoids, etc., had been unavailing It is no rarity at any age to see with increased growth in children, or weight in adults, clinical anæmias disappear, changing the patient's looks sometimes beyond recognition. I once read of some great surgeon

laries is under the same control The cells of secreting glands, and, in my belief, the ductless glands also, must acknowledge the same master, so that the gastric juice of the stomach, the bile of the liver, the internal secretions of the thyroid and adrenals, can all be influenced to deficiency or excess, according as the influence may be to hyper- or hypofunction, with resulting symptoms of exactly opposite character.

The sweat glands and capillaries of the skin are also under the same control

There are no end of things working through the emotions which can disarrange the autonomic nervous system either mildly, severely, or sometimes paralyze it to the extent of death, such as extremes of grief or joy, anger, thwarted ambition, humiliation, financial reverses, or disappointment in love, and the same train of systems may manifest, as will shortly hereafter be shown due to eye stress

A short explanation of what constitutes eye stress is in order It is the overcoming, by unconscious effort, of an impediment in the focus of the eye, to obtain its best vision. It has no especial relation to near work or fine work, and is most common in eyes which have perfect or nearly perfect vision either without glasses, or with the glasses they have While usually associated with some ocular discomfort or fatigue, it is not necessarily so, as in many cases all the manifestations are below the clavicle

This paper, being short, can only deal in generalities, but if any one desires to read illustrative cases, they are referred to papers by the essayist, entitled "Disturbances of the Heart and Liver Caused by Low Grades of Astigmatism," in the *New York Medical Journal* (Sept 25, 1920), and "Eye Stress as a Cause of Neuro-circulatory Asthenia, and Other Functional Heart Disorders" in *American Journal of Ophthalmology* for September, 1923

In the *Glasgow Medical Journal* of December, 1926, is an address by the Honorary Director of the James Mackenzie Institute for Clinical Research, at St Andrews, Dr Maitland Ramsay, a world-renowned oculist, setting forth the fact that by the similarity of the innervation of the ciliary (focussing) muscle in the eye, and the iris, the heart and the intestinal tract, these organs act in certain relations one to another

Observant clinicians for centuries have noted many of the phenomena herein listed, and have done their best to explain or relieve them according to the knowledge of their time It is likely that Hippocrates noted the association of dizziness with old age or gassing stomach, Heberden's description, over a hundred years ago, of angina pectoris has not been improved upon. Sir William Gowers, the great neurologist, in his text-book on "Diseases of the Nervous System," edition 1888, under the heading of "Migraine," has a wonderful description of the phenomena referred to in this paper But he, like all the neurologists whose descriptions I have read in the succeeding forty years, speaks of this disease as a mystery, and they all wander in a wilderness of complexities of diets, and multitudes of drugs and treatments, with no appearance of realizing that a proper correction of eye stress is a straight open road leading out of their jungle.

Lastly, the frequency with which certain surgical diseases can be mimiced, especially as regards the liver and gall-bladder, by eye stress is remarkable, and what is still more frequent, how after successfully performed operations the patient may fail of expected relief, which comes only after some perpetuating eye stress has been removed

In recent years the *Journal of the American Medical Association* abstracted a German article attempting to explain why so many operations on the liver failed to cure the patients, which ran the gamut of theories from A to Z In my own limited field of work, a good many of these uncured patients have been sent on their way rejoicing, after having their eyes properly cared for

holding up to scorn the futility of an oculist meticulously trying to correct, in a highly anæmic patient, the last quarter of a diopter of astigmatism. This might be true if the anæmia were due to some proven cause, as hemorrhages or hook-worm, but if the cause were not ascertainable, it might be opening a road for this patient's cure

As a thief of nervous energy, eye stress stands in the first rank, in some working out as neurasthenia, in some as myasthenia or muscular weakness, in some as psychasthenia with its morbid fears and despair of life, and others as neuro-circulatory asthenia, with its quick playing out, after moderate exertion, of a heart with no demonstrable disease

Accompanying this very commonly are cold, clammy hands and feet, sometimes with increase in size and blueness in color, from stagnation of terminal circulation. These symptoms are slow to disappear, but correspondingly slow to return when in course of years changes in the eye demand re-correction of its errors.

Another exceedingly common symptom, usually passed upon as neuritis, is a pain or pulling in the neck or shoulders, often extending as a numbness or tingling in the arms and fingers, with weakness of same When it occurs in the legs, patients think at first that they have had a stroke of paralysis

From disorder of the abdominal viscera come numerous bad dreams, so that some people say they dread to go to sleep Startled awakening when nothing has occurred is quite common, often accompanied by smothering Several instances have been observed where the seriousness of this smothering has produced such suffering or alarm as to cause sending for the doctor on many occasions during the night hours

Pure insomnia is a frequent result of eye stress, and can usually be cured by its correction.

The numbness and tingling in arms, hands, legs and feet, with symptoms of mild paresis, the fainting spells, blinding attacks, falls from vertigo, I believe to be due to angiospasm from disordered sympathetic innervation. Surgeons are now working on this system by removing the cervical sympathetic ganglions, and the stripping of the large arteries of their outer covering—periarterial sympathectomy

Pathology

SPECIMENS OF I FŒTUS PAPYRACEOUS, II PREMATURE SEPARATION OF A MALPLACED NORMAL PLACENTA, III RUPTURE OF UTERUS

By WALTER F HARRIMAN, M D.
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FŒTUS PAPYRACEOUS (COMPRESSUS)

CASE I.—The first specimen consists of one normal placenta removed after the delivery of a living female child at term, and attached to the placenta by a strip of membrane is another small mummified placenta having on its circumference the flattened mummified twin which had ceased to develop at about 4½ months of fetal gestation. This is clearly a case of *Fœtus papyraceous (compressus)* (Fig 1, Frontispiece)

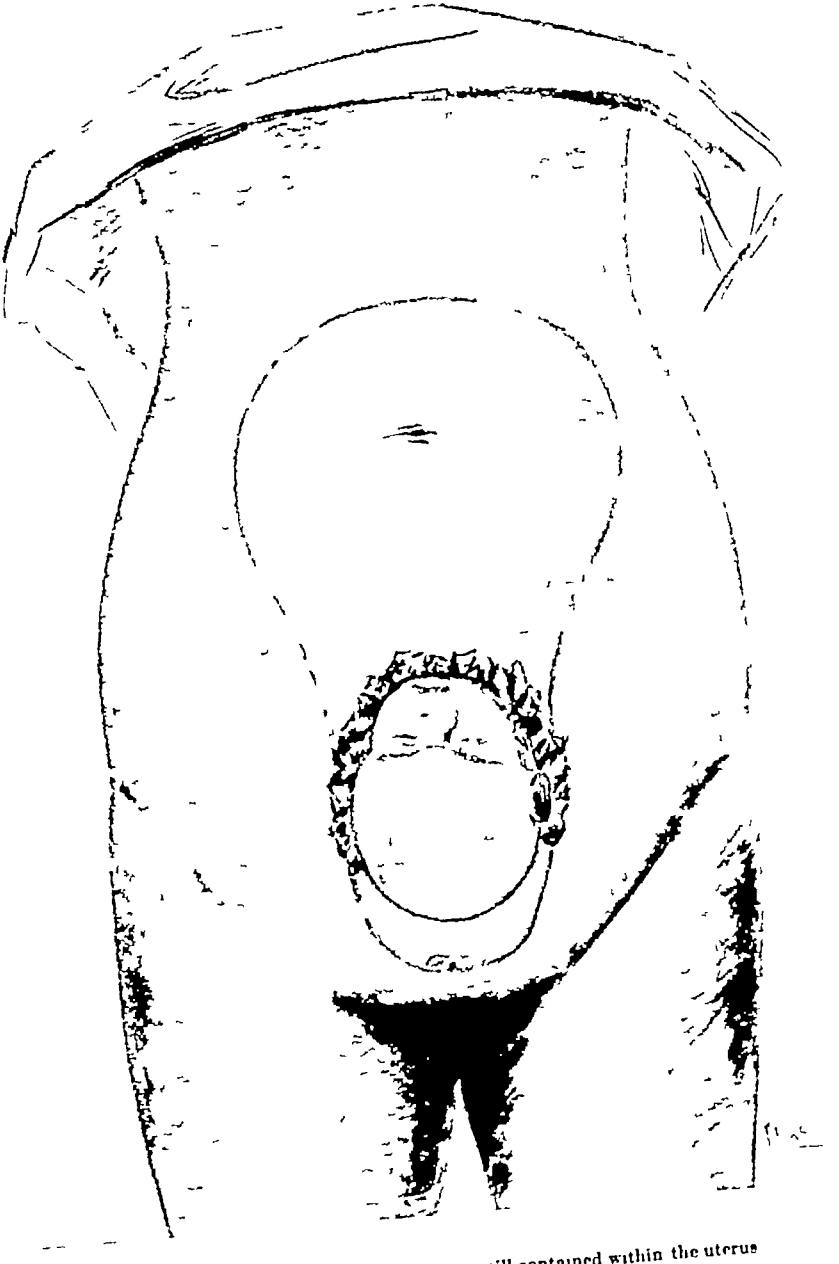
PREMATURE SEPARATION OF A MALPLACED, NORMAL PLACENTA

CASE II —Mrs G, thirty-eight years of age, was admitted to the Kensington Hospital for Women with a history of having been suddenly attacked with headache, blindness and a severe pain in her stomach On examining the patient the resident physician found casts and albumin in the urine and a systolic blood-pressure of 200 mm of mercury Believing that the patient was suffering from eclampsia, he took 400 c c of blood from her left median basilic vein and administered ¼ grain of morphine sulphate hypodermically Two hours later with the patient still unconscious, breathing in gasps and the pulse rapid and weak, Dr Daniel Longaker was summoned and after examination promptly diagnosed the condition as one of premature separation of a normally situated placenta At the operation, one hour later, a dead fœtus with a detached placenta and a large amount of clotted blood was removed, at which time the surface of the uterus appeared to be of good color A hysterectomy was decided against as the uterine circulation was considered adequate During the closure of the wound in the uterus and abdominal wall 400 c c. of blood were given by direct trans-

Fig 2

Gangrenous uterus from a patient with premature separation of a normally situated placenta The two denuded egg-shaped areas on the fundus show coagulated blood beneath the peritoneal covering

Fig 3



Low rupture of the uterus The child is still contained within the uterus
(Semi-diagrammatic drawing)

fusion The patient died twelve hours later At the necropsy a blackened gangrenous uterus was found, the vascular areas between the muscular areas being filled with firmly clotted blood It was apparent that death had been too early to have been caused by the gangrenous uterus, yet had the patient recovered from the severe hemorrhage and shock, she would most assuredly have died from this cause at a later date (Fig 2)

RUPTURE OF THE UTERUS

CASE III —Mrs C P , thirty-two years of age, was admitted to the Kensington Hospital after two unsuccessful attempts on the outside of delivering the child by forceps Digital examination revealed a fetal head apparently at the brim and engaged After an unsuccessful attempt to apply the Kielland forceps, an examination of the patient was made and it was found that the head was displaced upwards very easily and upon introducing the hand to perform a podalic version the rough unmistakable edge of a ruptured uterus was felt This rupture at the operation was found to completely circle the thin cervix in a transverse direction That the uterus remained in place was only due to the attachment of the broad ligament Oddly enough, the rupture was so low down on the cervix that the fœtus was contained up to the neck within the firmly contracted uterus This exceptionally low rupture left such a small friable portion of the cervix remaining that it was necessary, though extremely difficult, to suture the cul-de-sac to the bladder in order to effect a closure The patient had a mildly febrile convalescence, an extreme distention for seven days and developed a urinary fistula after the removal of the last drain At the end of three weeks the fistula had healed and the abdominal wound had closed (Fig 3)

A NEW METHOD FOR THE RAPID MICROSCOPICAL DIAGNOSIS OF TUMORS

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AND

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INTRODUCTION

VARIOUS methods have from time to time been introduced for the rapid microscopical examination of new growths and inflammatory tissues removed at operation, but on the whole the results have not been satisfactory owing to the imperfect sections obtained in the short space of time allowed

It occurred to us that as perfect preparations of intestinal parasites are obtained when films of intestinal mucus or fæces are fixed *in the wet* in Schaudinn's fluid, it might be possible to employ this method for the examination of new growths In our hands wet films of new growths and inflammatory tissues removed at operations have given a rapid and easily workable technical method The results of the first 231 consecutive specimens studied by this method, upon which this paper is based, have been very successful, as judged by the control examination of sections of the same tissue prepared in paraffin by the usual technic

Experience is required for this rapid method, as is necessary for all other laboratory methods, and it is essential to possess a sound knowledge of the microscopical study of new growths and inflammatory tissues by the usual technic We consider that the advantages of the method are the beautiful preparation of individual cells and fragments of tissue which are seen in the films, the simplicity of the technic, and the small amount of material required for the preparation of the films, all the necessary apparatus, with the exception of the microscope, can easily be carried in a portable case 12 inches by 8 inches by 3 inches Mistakes have occurred, but they are few in number, and only nine out of 231 examinations were definitely serious errors It is possible that in the course of time, and

with greater knowledge of this method, such mistakes will be less frequent, but it is difficult to believe that by any rapid method some errors will not occur, when we consider that the microscopical diagnosis of some new growths requires long periods of exhaustive examination. For these reasons we feel content in recommending the wet film method for the rapid diagnosis of new growths and inflammatory conditions It is only fair to add that a correct diagnosis was made in the majority of instances without any knowledge of the clinical condition or of the macroscopical appearance of the new growth It was considered that in testing a new method of this nature, it was important to dispense with this valuable assistance

TECHNIC

The tumor or other tissue is cut into, and the freshly cut surface scraped *firmly* with a sharp scalpel. The milky juice so obtained is spread evenly on slides and put immediately into Schaudinn's fluid while still wet The composition of this fluid is as follows (1) Saturated solution of mercuric chloride in distilled water, 2 parts, (2) absolute alcohol, 1 part. A few drops of glacial acetic acid are added so as to obtain about 4 per cent of the acid in the solution

The wet films are allowed to remain in this fluid from two to ten minutes according to circumstances If rapidity is essential, then an absolute minimum time of two minutes can be employed, but the *best preparations are obtained by ten minutes' fixation* The films are afterwards washed in spirit and then in distilled water Mayer's hemalum is employed as the nuclear stain, and eosin as the counter-stain. Dehydration and clearing are done with absolute alcohol and xylol, and the films are then cover-slipped with Canada balsam The total time required for the technical process can be as short as eight to ten minutes, but the time required for the microscopical examination is dependent upon the nature of the tissue and the rapidity of the investigator In 191 of the 231 cases a definite and correct microscopical diagnosis was made on the Schaudinn films alone, and in 218 cases the diagnosis made was correct but incomplete, it being correctly stated in 27 cases whether the specimen was simple, malignant, or inflammatory, but the exact nature not being fully determined on the films alone. In only thirteen

cases was the result of the film method materially different from the result of the paraffin section.

In some fifteen cases the rapid microscopical report was awaited by the surgeon, and utilized to decide the course of the operation, in all these cases a correct diagnosis was returned

It was not always found possible to diagnose correctly from the films whether a carcinoma was columnar- or spheroidal-celled The sections of the columnar-celled carcinomata examined showed areas of the spheroidal-celled type of growth, and frequently in the films the spheroid-celled portion only was recognized

Out of a total of 59 breast cases, there were 48 cases of carcinoma and chronic mastitis, which were diagnosed correctly in every instance, this being a most important practical application of the rapid method. About a dozen of these cases were examined while the surgeon awaited with an anæsthetized patient to decide the mode of completion of the operation.

SURVEY OF METHOD

Appearances of Cells—We have found that, in general, malignant cells appear larger than the corresponding normal epithelial or connective-tissue cells, the nucleus is frequently eccentric, and occupies a larger proportion of the whole cell A reticular staining of the nucleus, the presence of nucleoli, and mitotic figures are usually clearly seen. The individual malignant cells may vary considerably in size, whereas the film preparations of a simple tumor or a normal tissue show cells of a regular size and appearance, with small, evenly stained, centrally placed nuclei

Arrangement of Cells—The manner of the breaking up of the cells in the film also depends upon the type of tissue A normal tissue, if scraped, does not make a good film because fragments of normal tissue, such as plaques of squamous epithelium, shreds of mucosa showing complete tubular glands, and strands of fibrous tissue, occur as isolated masses without intervening cells Scrapings of a simple tumor, such as an adenoma of the prostate, show the cells in rather smaller clumps than in normal tissue The individual cells are of normal size and appearance, but the complete glandular structure is not seen, and isolated cells are comparatively few A carcinoma breaks up much more completely, the cells are not only

different in appearance, but perhaps half the cells present will be isolated like cells in a blood film, while only a certain proportion will be grouped in twos, threes, or in small plaques The stroma of a carcinoma is not usually seen, hence the occasional difficulty in distinguishing a carcinoma from a sarcoma. The cells of sarcomata, as a rule, break apart from one another almost completely, giving a uniform film of cells with few, if any, plaques of tissue

It is of particular interest that new growths of low malignancy, such as rodent ulcers and parotid tumors, of which we have examined nine specimens, show in their film histology characters intermediate between the typical carcinomata and the simple tumors The cells are rather more regular in size, and the nuclei stain darker and more evenly The film usually shows considerable plaques of tissue as well as large numbers of isolated cells

CONCLUSIONS

(1) A wet film method for the examination of new growths and inflammatory tissues is described

(2) The technic is very simple, and requires no elaborate apparatus

(3) The time required for the preparation of the microscopical specimen of a tissue removed at operation is from eight to ten minutes

(4) The method is unsuitable for post-mortem specimens

(5) Two hundred and thirty-one cases have been so examined, and 218 correct diagnoses returned

(6) *Special experience of this method should be acquired before it is employed in practice*

1927 Mütter Lecture of the College of Physicians of Philadelphia

THE PATHOGENESIS OF GASTRIC AND DUODENAL ULCERS *

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At times one is inclined to become discouraged over the apparent lack of progress made in our knowledge of disease However, if we look back just a few years to the time when Doctor Mutter was Professor of Surgery at Jefferson Medical College (1841–1856) we realize that something has been accomplished Several years after Doctor Mutter's time (1885), Pepper's "System of Medicine" appeared containing a chapter on gastric ulcer written by Dr William H. Welch, which remains to this day the best résumé of the etiology and pathogenesis of this condition in the literature Duodenal ulcer was not even considered in those days

I chose the subject "The pathogenesis of gastric and duodenal ulcers" for the lecture which you have so kindly invited me to deliver, hoping that, although I had little information to give, I might clarify my own opinions and possibly be of help to some one else

Duodenal and gastric ulcers are separate and distinct lesions The cause or causes of these ulcers are not as yet known In order to treat the lesions in a rational manner an attempt must be made to correlate and clarify the many conflicting views regarding their nature and origin

The problem of the origin of gastric and duodenal ulcers has been studied from the clinical, experimental, anatomic and pathologic points of view The approach to such study is difficult, especially experimentally, because these lesions are peculiar to man Cohnheim divided the problem into two parts, namely, the cause of the original defect and the cause of chronicity This division of the problem

* Mütter lecture, given before the College of Physicians, Philadelphia, Penna., December 7, 1927

simplifies it in some ways That an acute ulcer may become chronic is a reasonable assumption Nevertheless it is an open question whether the occurrence of chronicity involves fundamental principles other than those involved in the origin of the original defect

During the first decade of this century the question of the origin of ulcers centred around the theories of Rokitansky and Virchow, who believed that ulcers are the issue of the combined action of localized vascular disturbance with focal nutritional changes, and the digestive action of the gastric secretion on the devitalized tissue In principle, this hypothesis is held to-day

Aschoff stresses the Cohnheim theory and attempts to explain the cause of erosions on the one hand and the factors producing chronicity on the other He differentiates two types of erosions, those of the fundus of the stomach and those occurring along the lesser curvature in the gastric pathway Only the latter have a direct bearing on this problem Erosions in this area may be due to spastic conditions of the channel itself or to arterial blocking of a spastic, embolic, or arteriosclerotic nature The factors tending to produce chronicity are grouped together under the mechanical-functional theory of Aschoff

The structure and function of the gastric pathway must first be considered It is formed usually of four longitudinal folds extending along the lesser curvature of the stomach from near the cardia to the pyloric canal, where it becomes obliterated rapidly The muscle coats are so arranged that contraction causes the structure to assume the form of a channel through which at least a portion of the contents of the fundus may be drained into the pyloric canal. This channel represents, according to Bauer, a rudimentary gullet In this area the mucosa is thinner and more firmly fixed and the blood-supply is poorer, especially at the isthmus Also less mucus forms in the gastric channel than in other portions of the stomach These factors help to explain why erosions of the gastric channel have a tendency to become chronic

The form commonly assumed by gastric ulcer is due to peristaltic contractions which tend to push the mucosa over the edge of the ulcer, producing an overhanging edge and allowing the gastric juice to stagnate and burrow, thus giving the ulcer the characteristic fun-

nel shape and sloping course. The significance of this explanation is perhaps over-estimated as many gastric ulcers vary greatly from this so-called "characteristic type." Moreover, the explanation does not hold for duodenal ulcers

The characteristic lesion of peptic ulcer in human beings is usually on the lesser curvature of the stomach in the pyloric mucosa or just distal to the pylorus in the duodenal mucosa It thus occurs in the region of the gastro-intestinal tract which may be exposed to an acid medium and on which the gastric contents may impinge with considerable force during the passage of food through the stomach These two considerations form the basis for Mann's experimental investigation of peptic ulcer

TABULATION

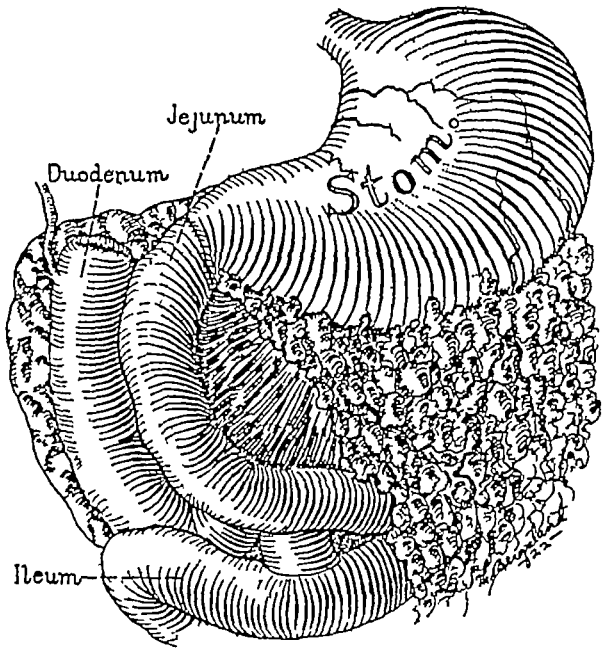
Experimental Production of Peptic Ulcer (McCann)

- Vascular
  - Emboli
  - Ligation of vessels
  - Vascular spasm
  - Portal insufficiency
- Bacterial
  - Ingestion of bacteria
  - Intravenous injection of bacteria
  - Specific organisms and foci of infection
- Toxic
  - Pharmacologic toxin
    - Systemic
    - Local
  - Biologic toxins
    - Burns
    - Gastrotoxin
    - Antitoxin
    - Bacterial products
  - Miscellaneous
    - Heat
    - Cold
    - Radiation
- Trophic
  - Central nervous system
    - Vagus section
      - Cervical
      - Thoracic
      - Abdominal
    - Stimulation and irritation
  - Sympathetic nervous system
    - Splanchnics
    - Celiac plexus
  - Combined vagus and sympathetic section
- Glandular
  - Adrenal } Single and combined
  - Thyroid } Single and combined
  - Liver
- Digestive juices
  - Chemical
    - Hydrochloric acid
    - Bile and bile salts
  - Surgical
    - Exclusion of bile
    - Exclusion of pancreatic juice
    - Duodenal drainage
      - Ileal
      - Gastric

Previous investigations had shown that it was difficult or impossible constantly to expose the gastric mucosa to an acid medium

by administering acid It was believed that such exposure might be brought about by eliminating the secretions poured into the duodenum beyond the pylorus, which tend to neutralize the acid that has not been neutralized in the stomach Such elimination has been accomplished by various types of experiments, such as removal of the duodenum, transplantation of the common bile-duct and pancreatic

Fig 1



Schematic drawing of the operation devised by Mann for the production of ulcers experimentally

ducts, and a combination of these two procedures A varying percentage of ulcers was produced in the duodenum or jejunum by each of these methods, depending on the type of operation However, the most satisfactory method for producing subacute or chronic peptic ulcer experimentally is the one devised by Mann, that is, to sever the pylorus, invert the distal end of it, sever the jejunum a few centimetres distal to the ligament of Treitz, anastomose the distal end to the pylorus, and anastomose the proximal end of the jejunum to the ileum 30 to 60 cm from the termination of the ileum (Fig 1) These procedures cause the gastric contents to be expelled from the stomach into the jejunum without becoming mixed with the

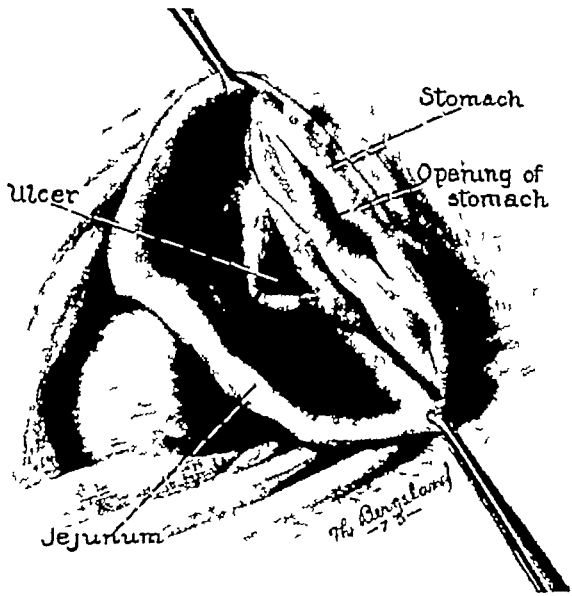
secretions poured into the duodenum, the bile, the pancreatic juice, and the duodenal juice, which are drained into the ileum.

Peptic ulcer develops in almost every animal in which the foregoing procedures have been carried out (Figs 2, 3, 4 and 5) The time after operation in which the ulcer develops varies In some instances the ulcer has perforated as early as ten days after operation, and in others it has not started to develop after three months or longer The ulcer is almost always in the intestinal mucosa just distal to the suture line, lateral and posterior to the central axis of the organ Usually only one ulcer is present, although sometimes two and rarely three develop In the early stage the ulcer never involves the suture line, although retrograde formation may occur which will eventually reach the suture line The ulcer appears grossly like the peptic ulcer noted in man (Fig 6) It is more or less circular and punched out with a hard base and overhanging edges Many of the ulcers perforate and if death from peritonitis does not occur, closure will be effected by adjacent coils of the intestines, omentum, pancreas, or gall-bladder Perforation has occurred into the colon and gall-bladder and through the anterior abdominal wall Hemorrhage from the ulcer may result fatally In some instances Mann and his associates have observed the development of these ulcers from the time when only slight injury to the mucosa was noticeable until they became large, indurated and perforated and had existed for from four to six months Macroscopically the ulcer first appears as a saucer-like depression in the mucosa In the earliest stage all that can be seen is a small area covered with homogeneous gray material Gentle sponging uncovers a slight depression where the surface of the mucosa has disappeared and where bleeding is profuse This gray covering has been noted on all ulcers that have not penetrated beyond the mucosa at the time of examination Often it is the only means of recognizing "beginning ulcer," the mucosa otherwise appearing normal After the mucosa has become eroded the process of ulceration may proceed quickly until the entire wall of the intestine is perforated or there is a hard indurated base After an ulcer has once started it develops rapidly, the minimal time necessary for penetration through the mucosa is only a matter of hours An ulcer may develop in mucosa which macroscopically

Fig 2

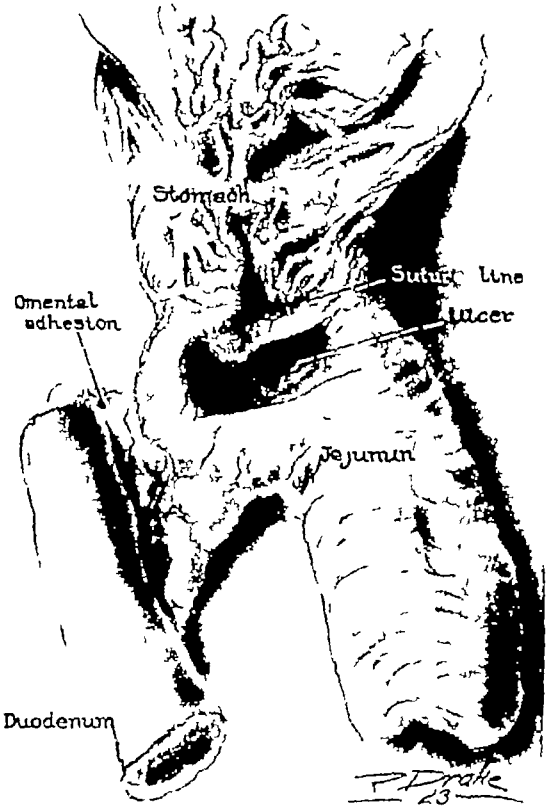
Ulcer just beyond the suture line in the jejunum following Mann s operation This ulcer is similar to those seen in the stomach and duodenum of human beings

Fig 3



Developing ulcer

Fig 4



Ulcer in Fig 3 about four and a half months later At intervals of six weeks the ulcer was observed on exploration The chronic appearance did not greatly alter during the whole period of observation

Fig 5

Edge of a rapidly developing ulcer A large amount of necrotic tissue is shown

Fig 6

Typical chronic ulcer of the stomach in a human being It shows more localized gastritis than is observed in the experimentally produced lesions but otherwise it is similar

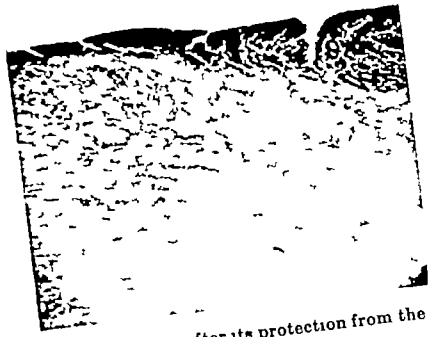
Fig 7

Beginning ulcer The saucer shaped lesion starts in the surface

formed over it (Fig 9) Within ten days the ulcer has greatly decreased in diameter and depth and the mucosa has begun to grow in from the edges On the twentieth day three-fourths or more of the base is covered with mucosa (Figs 10, 11, and 12) After the thirtieth day it is almost impossible to find the site of the ulcer (Fig 13).

Mann studied healing ulcers both macroscopically and microscopically Macroscopically the first evidence of healing is the disappearance of exudate and débris from the base, and the formation of a smooth surface Then the ulcer appears to grow shallow, owing to filling in of the base by new granulation tissue The overhanging edges of mucosa and the granulation tissue completely fill the base of the ulcer Gradually the edge of mucosa grows from the periphery toward the centre, usually pushing the granulation tissue up and out like a plug At first the mucosa is thin and smooth Gradually it thickens and is thrown into folds Inflammation in the base subsides and the hard induration disappears The development of the granulation and connective tissue, and the growth of the mucosa, can be closely observed microscopically As the base of the ulcer becomes clean a thin protective covering appears Then the leukocytes gradually disappear and granulation tissue develops. The disappearance of the leukocytes is probably dependent on the protective covering which prevents bacteria from penetrating the base of the ulcer The granulation tissue is usually extremely vascular and it may readily be surmised that if the base of a healing ulcer is injured, copious hemorrhage might occur The connective tissue proliferates and usually a thin limiting membrane forms over the base of the ulcer The mucosa grows in from the edges over the surface of the granulation tissue At first the mucosa consists of only a single layer of flat or cuboidal cells on a basement membrane Often the growing edge of mucosa is under an overhanging protecting edge of the plug of granulation tissue in the centre The granulation tissue grows like a toadstool with the pedicle at the centre of the ulcer and the top overhanging the edge of mucosa As the cells of the mucosa increase in number and size, they become typically columnar and the smooth edge is thrown into small folds which carry the newly formed connective tissue with them. At first the folds are

Fig 9

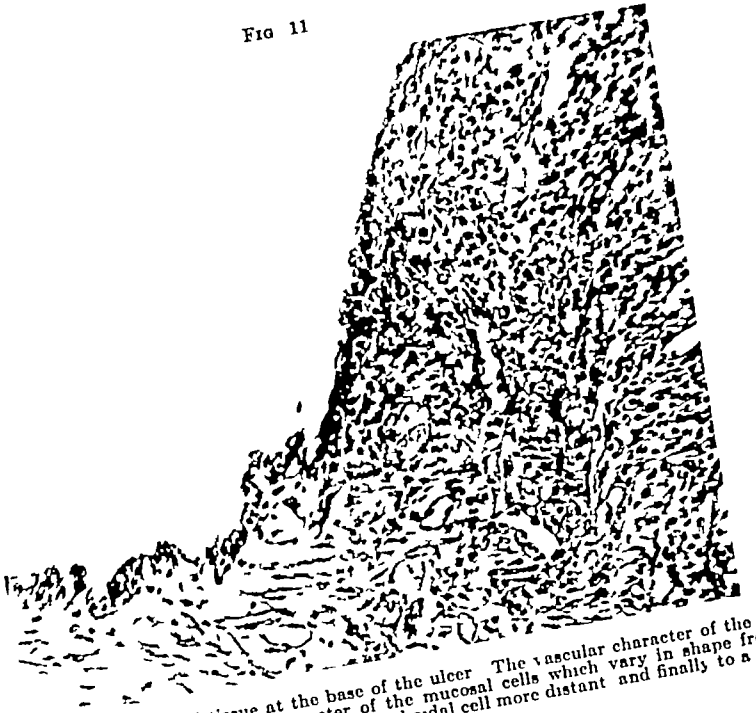


Edge of the ulcer shown in Fig 5 four days after its protection from the gastric contents Evidence of healing is shown

Fig 10

Ulcer almost completely healed Granulation mushroom like growth in the centre and growing in of the mucosa from the edges may be noted

FIG 11



Edge of the granulated tissue at the base of the ulcer The vascular character of the granulation tissue and particularly the character of the mucosal cells which vary in shape from the columnar cells near the edge of the ulcer to the cuboidal cell more distant and finally to a flat cell creeping out over the surface of the granulation tissue

Fig 12

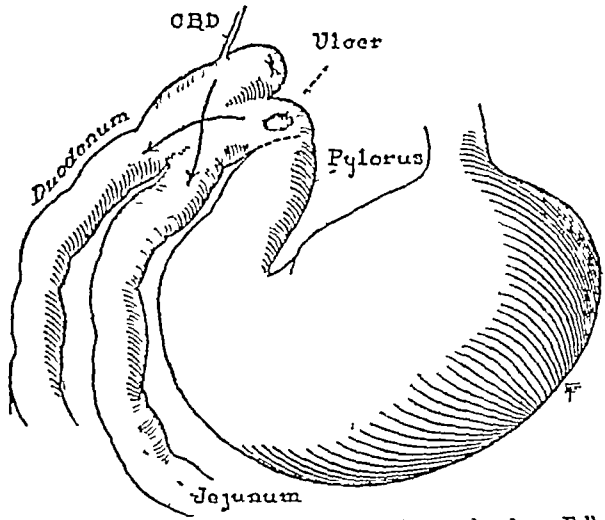
Gastrojejunal ulcer which illustrates attempts at healing

Fig 13

Healed edges in an ulcer showing the break in the continuity of the muscularis which does not regenerate Connective tissue at the base of the ulcer and bizarre shape of the tubules in the regenerated mucosa also are shown

small and wavy, but as the mucosa grows, the typical normal villi appear The growing edge of mucosa is very fragile and it can readily be seen how easily it would be destroyed by the passage of the gastric contents over it As a matter of fact, Mann says he has never been sure we were studying the ultimate growing edge because,

Fig 14



Method of draining the contents of the duodenum back over the ulcer Following this procedure the ulcer also heals but the healing process is complicated by injury due to the passage of the gastric and duodenal contents over it. This proves that when the relation of the gastric and duodenal contents is restored the ulcer heals even though the material in the gastro-intestinal tract passes over the ulcer

with the most careful technic in preparing the specimen, it always seems as though some of the edge is lost

Early in the healing of an ulcer the macroscopic changes are more noticeable than the microscopic Histologically the protected ulcer presents definite variations from the specimen removed at operation but careful study reveals a similarity of the processes in the two specimens. This observation reveals that the healing processes are active in ulcers at all times, but when an ulcer is not protected from the gastric contents the newly formed cells are destroyed before they can become an integral part of the tissue

An ulcer will also heal if it is only partially protected from the gastric contents Morton found that healing occurred following gastro-enterostomy Furthermore when the duodenal contents were drained back over the ulcer, healing occurred (Figs 14 and 15).

However, in both instances the healing process is irregular and in many instances some of the granulated tissue is injured and hemorrhage into the base of the ulcer may occur According to Mann the following points are pertinent·

(1) Chemical and mechanical factors appear important in regard to the process of development of peptic ulcer

(2) The time necessary for an ulcer to develop and become chronic is relatively short

(3) The ulcer begins at the surface of the mucosa

(4) All complications observed in ulcers of human beings have been noted in the experimental ulcer

(5) The ulcer heals readily when protected from the gastric contents

(6) The healing process is characteristic

(7) If for any reason the granulation tissue in the base of a healing ulcer is injured, profuse hemorrhage may occur

(8) Observations on the process of formation and the process of healing of ulcers disclose the reason for chronicity They become chronic because the new cells formed in the process of healing are destroyed by the acid or swept away by the passage of the gastric contents before they have had an opportunity to establish themselves as an integral part of the tissue The following prove the foregoing statement (*a*) Ulcers heal with remarkable rapidity after being protected from the gastric contents, (*b*) new tissue formed in the healing process is easily injured or destroyed mechanically, as by gentle washing with tap water, and (*c*) reparative processes are at all times active in the ulcer They probably begin immediately after the injury The destructive process which produces the ulcer and the attempts at repair go on simultaneously However, each protective covering formed over the base is destroyed before healing can take place beneath As the delicate cells of the mucosa develop in the edge of the ulcer they are killed or washed away It is thus evident that the chemical and mechanical factors are potent in the development of chronicity

An interesting observation was made by Bollman and Mann in their researches on the liver In experimental animals duodenal ulcer followed the performance of partial hepatectomy or Eck fistula,

and in some instances after ligation of the common duct Ulcer occurred often enough to interfere considerably with the experiments In many instances the ulcer perforated and the animal died It is possible that trauma is a factor in the production of some of these lesions, in others it probably is not a factor In the ligation of the common duct the bile is withheld from the duodenum and this may be a factor in the production of ulcer, but in partial hepatectomy and Eck fistula the only change would be in the tissue of the liver or in the circulation to the liver Whether or not chronic ulcer of the duodenum may be brought about by some disturbance of the function of the liver is an interesting speculation.

Morton, experimenting on dogs, first demonstrated the inherent power of tissue of the normal stomach to heal He then excised small areas of gastric mucosa in different regions of the stomach and instituted surgical duodenal drainage after the technic of Mann In 50 per cent of twenty experiments gastric ulcers of subacute and chronic type were produced on the lesser curvature while similar areas on the greater curvature healed. In a series of experiments in which surgical duodenal drainage was instituted and followed two weeks later by the excision of small areas of gastric mucosa, all areas showed delay in healing In 62 5 per cent of the more prolonged experiments gastric ulcers of subacute and chronic types were produced on the lesser curvature while similar areas on the greater curvature healed In another series of experiments patches of jejunum with intact circulation were transplanted into the stomach at various points These remained normal After varying periods surgical duodenal drainage was instituted Typical chronic ulcers developed in three of five patches on the lesser curvature Ulcers did not form in patches in other areas These observations again emphasize the significance of the chemical and mechanical features in the formation of ulcer

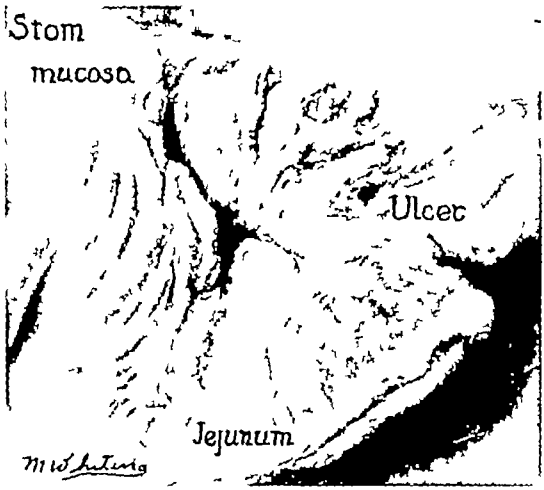
Von Bergmann enlarged the outlook on the origin of ulcer from a clinical point of view According to the neurogenic theory of von Bergmann, ulcers are the result of dysfunction of the vegetative nervous system Nervous factors produce spasm either of the muscle or vessels in localized areas with resulting circumscribed ischæmia of the mucosa from which localized mucosal defects arise Such

defects tend to produce further nervous irritability and thus favor chronicity It is pointed out that certain portions of the stomach, the cardia, the angle, and the pylorus, are more plentifully supplied with nerves than other areas, so that the generally specific site of the lesions is not necessarily an argument against the theory Much effort has been expended to prove or disprove the neurogenic theory by means of animal experiments Various investigators have injected pilocarpine and other spasm-producing drugs, removed the cœliac ganglion, cut the splanchnic nerves, and by long-continued stimulation of the vagus have been more or less successful in producing acute or even chronic ulcers in animals The results, however, are so variable that it is difficult to draw conclusions and even in the most successful experiments it must always be remembered that the conditions met with are not necessarily applicable to man

Koennecke has shown in dogs that the secretion of the pyloric glands functions in some way to stimulate the acid secretion of the fundus Clinical observations have shown that pyloric exclusion favors the formation of a particularly powerful gastric juice, the procedure, therefore, is avoided and pyloric resection is advocated by surgeons who lay great stress on the importance of the acid factor in the cause of ulcer

Konjetzny's theory of the inflammatory origin of ulcer is based on gross and microscopic study of tissue resected at operation Konjetzny, Orator, Puhl and others observe that in many cases of gastric and duodenal ulcer there is more or less extensive gastritis and duodenitis According to Konjetzny and Puhl the observation in a single resected specimen of all the stages from simple erosion to chronic ulceration gives the impression that all the steps in the pathogenesis of chronic ulcer are represented In several patients giving a long history of ulcer only duodenitis and gastritis were found This discounts the claim that gastritis and duodenitis are necessarily secondary to chronic ulcer Puhl believes that gastritis and duodenitis are primary to the formation of chronic ulcer Exogenous irritative factors and constitutional states play an important part in causation Such lesions are common and usually subside, but in the presence of certain conditions, as the mechanical functional factors of Aschoff, chronic ulcer develops.

Fig 15



Ulcer shown in Fig 14 eight days after its protection from the gastric contents The granulated tissue partially fills the crater

Fig 16

Typical lesions produced in a rabbit by injecting into the circulation streptococci cultured from a tooth of patient who had an ulcer of the stomach The same type of lesion is often produced by using cultures taken from the tonsils and occasionally from the prostate or from the lesions excised at operation Rosenow has also reproduced the ulcer with the streptococci recovered from the experimental lesion This lesion is different from the chronic ulcer found in the stomach or duodenum but is similar to the duodenal lesion which we call 'duodenitis

Gastric resection is not often performed in cases of duodenal ulcer In duodenal ulcer, however, a considerable portion of the duodenal cap together with the anterior half of the pyloric sphincter and a small adjoining piece of stomach is frequently excised In studying the specimens thus obtained one will be surprised at the frequency with which duodenitis appears as the only lesion In a recent report [7] of twenty-six cases, in spite of a long history typical of ulcer and with positive rontgenograms, only duodenitis could be demonstrated pathologically No evidence of ancient or recent chronic ulceration was found in any of the specimens In gastric ulcer it is often possible to demonstrate more or less widespread gastritis That inflammation plays an important part in the ulcer problem is further shown by the fact that in twelve cases operated on for jejunal ulcer true ulcer was not found In these cases the jejunum was thick, distended, friable, red and œdematous, and the mucosa was covered with tiny hemorrhagic areas Undoubtedly duodenitis is a surgical and pathologic entity, but its relationship to chronic duodenal ulcer is not clear, neither is the full significance of gastritis and jejunitis as entities appreciated

The pathologic data in cases of duodenitis call attention to the work of Rosenow, as the lesions closely resemble those he produced in animals by injecting specific strains of streptococci (Fig 16) Rosenow has recovered these strains from the tonsils and infected teeth in patients with ulcer of the stomach or duodenum and also from inflammatory duodenal tissue removed at operation Puhl was able to demonstrate organisms in tissues showing gastritis and duodenitis but could not culture them. Recently Nickel and Hufford recovered a green-producing streptococcus from tissue removed at operation in ten of eleven patients having ulcer They say that the localizing power of the streptococcus so constantly found in the foci of patients suffering from ulcer is further illustrated by the results obtained from this series of patients with ulcer At operation four of the eleven patients were found to have gastric ulcer, four duodenal ulcer, and three gastrojejunal ulcer In ten of the eleven cases, the green-producing streptococcus was isolated from the resected ulcers, and all ten strains produced specific lesions in rabbits Twenty-eight of thirty-one rabbits injected intravenously with these strains de-

veloped hemorrhagic erosions or ulcers in the stomach or duodenum. The foci of these eleven patients were investigated in the same manner as in the first series A tonsil or nasopharyngeal culture was obtained from every case and nine of the eleven cultures produced positive gastroduodenal lesions in experimental animals Of the twenty-two rabbits injected intravenously with these cultures of the tonsils and nasopharynx in thirteen lesions of the stomach or duodenum developed. Two of the cultures obtained from the teeth of these patients produced gastroduodenal lesions in rabbits, and in three of the eight rabbits injected with the cultures of the teeth gastroduodenal lesions developed Similarly in this series one of six cultures of the prostate harbored streptococci and when a rabbit was injected with this culture gastroduodenal lesions likewise developed Thus, in sixty-two animals injected with culture of ulcers and foci of the patients in this series, lesions of the stomach or duodenum developed in forty-five (73 per cent) in contrast to lesions of the gall-bladder, heart and lungs (3 per cent.), intestine (5 per cent), and kidneys (7 per cent.)

Some of the foregoing theories, although ostensibly referring to both gastric and duodenal ulcers, seem to be more directly applicable to the former The lesions are distinct Duodenal ulcer occurs about ten times as frequently as gastric ulcer No doubt many of the same factors play a part in the etiology of both gastric and duodenal ulcers Probably some of the factors involved in the production of these two lesions are different

Ulcers form in the jejunum not only following gastro-enterostomy for ulcer of the duodenum but also after resection of the stomach for duodenal ulcer Furthermore, ulcers recur in the jejunum after resection of the stomach for jejunal ulcer Recurrence in the jejunum has been known to occur repeatedly, even when several resections have finally resulted in the removal of the greater part of the stomach. These experiences tend to support Mann's experiments and the mechanical and chemical theory of the cause of ulcer, but do not prove that the removal of the lesser curvature will prevent their formation. Experience seems to show that there is a tendency for the formation of ulcers in certain individuals and that no matter what treatment is undertaken recurrence is almost certain

to follow The factor responsible for this has not been determined and its discovery will yield valuable information concerning the etiology and pathogenesis of ulcer

The final word concerning gastric and duodenal ulcers has not yet been spoken The multiplicity of hypotheses advanced to explain their origin indicates that many factors play a part, differing perhaps in each case In the presence of conflicting views regarding the origin of ulcers, different forms of treatment are justified only on the basis of experience A sharp line is drawn between gastric and duodenal ulcers The problem of cancer enters into the consideration of gastric ulcer No matter how small the percentage of gastric ulcers affected by cancer, it adds to the seriousness of the disease Cancer almost never occurs in the first part of the duodenum Many duodenal ulcers heal permanently under medical treatment The element of seriousness in duodenal ulcer is introduced by the occurrence of jejunal ulcer in a small percentage of cases in which gastro-enterostomy has been performed Because of the menace of jejunal ulcer gastro-enterostomy is avoided whenever possible, especially if patients are young and there is a history of hemorrhage In such cases, it is preferable, whenever possible, to excise the cap of the duodenum and the anterior part of the pyloric sphincter and close the opening as a gastroduodenostomy Gastric ulcers are either excised and gastro-enterostomy performed, or partial resection of the stomach is carried out Methods of treatment vary with the problem presented by the individual case and conservatism should be the dominating influence except when the question of cancer enters the problem.

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Medical History

THE RENAISSANCE *

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One of the reasons why medical history seems often so uninteresting is the tendency of medical historians to treat the history of medicine as an entity, complete in itself and without correlating it to the general historical background, against which it moves and of which it forms an integral part. The physician is, first of all, a man of his own day, impregnated with its prejudices, governed, more or less, by its accepted standards, and influenced, at every turn, by its general atmosphere He is only "secundo loco" a physician. His "medicine" is something superimposed upon a personality, already formed by heredity and influenced by environment In order to get the fundamental characteristics of any period of medical history, one must learn to reconstruct, to appreciate—as it were, to "taste" the elusive thing that we may call the "corporate consciousness" of that particular stage of our civilization. Until we have immersed ourselves in this mental atmosphere, we cannot appreciate the motives or analyze the reactions of our medical colleagues of a past generation no matter how much we may endeavor so to do

This is especially true of the period that we call the Renaissance, the "Revival of Learning" We date its inception roughly, by the invention of printing, about 1450 But the seeds, that flowered into its multiform harvest, were sown long before that These seeds, however, were not noticed by contemporary thought And the manner in which they grew almost in secret, only to flame suddenly into an astonishing flower, that seemed to spread all at once through European fields of consciousness, is one of the miracles of history

* This is the last one of four papers upon medical history which have been appearing in the last three consecutive issues of the International Clinics "Medicine from the Standpoint of History" (vol. ii, 1927, pages 158–170), "Greek Medicine" (vol iii, 1927, pages 237–247), and "The Middle Ages" (vol. iv, 1927, pages 247–263)

If, like a scientific investigator of deep sea life, you drop a mental dredge into the depths of the corporate consciousness of European civilization, at any point during the Middle Ages, in almost any European country, in any day of the many hundreds of years between the founding of the Holy Roman Empire and the beginnings of the Renaissance, your dredge will almost always bring up the same specimens Occasionally you may find a stray, peculiar shell, different from all the rest, an unusual fish that refuses to look and act like all the others But as a rule your findings will be the same Then, if you suspend your dredging activities for some years, and drop your line again in the very same waters, you will be not only astonished, but aghast at your discoveries. Almost all the old types have abruptly disappeared Everywhere, you find masses of new life, of types hitherto unknown. It seems as if the very waters in which you are dredging, had suddenly changed themselves, in some mysterious way

When one tries to examine this apparently sudden change in the corporate consciousness at the beginning of the Renaissance, this abrupt shifting from an old well-known atmosphere, from a familiar background to an entirely new method of life, to a readjustment of all values, to a vividly fresh color scheme, one is reminded of a chemical process that one learned—and doubtless thereafter forgot—during one's pre-medical course in chemistry

Acids and alkali are chemical opposites In the laboratory, phenolphthalein is used as an "indicator" of the acid or alkaline condition of a solution In one which is acid it is colorless, while in one which is alkaline it is bright red If you have an acid liquid which contains a little phenolphthalein it appears clear and colorless You begin now to drop into this colorless liquid an alkali The first drop causes no apparent change, neither, perhaps, does the second, nor the third, nor the hundredth But gradually you reach the border-line between alkalinity and acidity You may be only one drop from alkalinity and yet your solution remains transparent and colorless But there comes a time when you have added to your acid liquid all the alkali with which it can react And now one single drop more of alkali is of deep significance It causes every drop of the erstwhile acid liquid to become definitely alkaline Before this point

of neutralization was reached you could drop in not one drop but ten or a hundred and there would be no change Now one more drop—only one very tiny one—and abruptly your pelucid, colorless liquid becomes a bright red Not only here and there but everywhere This last drop has brought about a change that you had been preparing all along by your constant addition of alkali, a change, however, that was not visible to your eyes until the last drop brought out new, hitherto hidden colors and characteristics Moreover, in order to turn your red solution back to its former colorless state again, you cannot remove that last revolutionary alkaline drop

If one applies this chemical picture to the transition from the Middle Ages to the Renaissance, one gets a clearer understanding of that sudden change of mental attitude, that abrupt shifting of all relative values, which swept over the corporate consciousness of Europe during the last half of the fifteenth and the early years of the sixteenth century

Long before Martin Luther repudiated his monastic vows and took unto himself a wife, there had been monks aplenty who had done the same thing, without upsetting the peace of Christendom Before Leo X found it necessary, as a purely financial measure, to raise funds for the completion of St. Peter's by pushing a little the market value of Indulgences, there had been sovereign pontiffs amany who had raised money by much less satisfactory means The man who paid for an Indulgence, which assured his scrupulous mediæval soul that his slate had been wiped as clean of sin as might possibly be, got something for his money, something that gave him peace and assurance in the hour of death It was worth the price, and more too Other popes had levied ecclesiastical "taxes" in much less pleasant ways There had been quarrels between learned men, one calling the other a heretic, long before Reuchlin and the conservative Dominicans at Cologne got at one another's literary throats And there had been plenty of young fire-brands, quite as fiery and as luetic as Ulrich von Hutten, who had whirled themselves through the Middle Ages without starting a conflagration But now—at the beginning of the sixteenth century—now, all these people and the things that they said or did or wrote were "last drops" in the solution of an ancient social order that, although

retaining its ancient form and color, was still, invisibly, so near the point of saturation that it needed only a runaway monk, a pope with a badly balanced budget, two groups of quarreling ecclesiastics, a syphilitic, scatter-brained knight, and a few others like them to alter the entire fundamental tone and color of European thought and action.

Nevertheless, the great things, the "big drops" that had brought corporate consciousness so near the saturation limit that another single comparatively insignificant "little drop" would change everything, are often overlooked And some of these "big drops" are especially interesting to the medical historian.

Father Heinrich Denifle, the distinguished Dominican historian, gives interesting descriptions of the low level of spiritual life in the monasteries just before the Reformation and of the slack moral and disciplinary atmosphere in which Luther was bred and from which he revolted [1] Denifle finds the real cause of this general deterioration in the "black death," the plague that swept Europe, after having ravaged Asia and Africa, and that, from its first appearance in Europe in 1348, is said to have carried off one-fifth of the entire population [2] In times of such mortality, all rules had to be modified, old restrictions altered The best type of young men, who had formerly entered the monasteries not only through spiritual aspirations, but also because of the scholarly atmosphere and the social and political advantages, had disappeared The old men, who represent always the conservative element in any society, had also been swept away by the plague, as well as a large proportion of the men and women of middle age, the fathers and the mothers, the home-making, solidifying factors During the worst of the plague, schools had to be closed, the law could not be enforced And so a new generation, developing under these circumstances, grew up

[1] *Cf* "Luther und Lutherthum in der ersten Entwicklung," Quellenmaessig dargestellt von P Heinrich Denifle. O.P, Mainz, 1904, bei Franz Kirchheim Einleitung, pp 2–25 passim.

[2] "One fourth of the population of the earth, over sixty millions of human beings," says Garrison, "History of Medicine," 3rd ed., pp 180–181 See also, "The Black Death. A Chronicle of the Plague," compiled by Johannes Nohl, translated by C H. Clarke, Ph.D, London, George Allen, 1926 Also "Plague and Pestilence in Literature and Art," by Raymond Crawford, Clarendon Press, Oxford, 1914

without the authority of parents or older brothers at home, and without any stern legal checks from the law outside From this weak-kneed, flabby generation, the professions had to recruit their already thinned ranks Medicine does not seem to have suffered quite as much as other callings, although we shall see, later on, how low the level of our profession had sunk. The priesthood, especially the great monasteries, had to fill their seminaries and novitiates somehow In order to attract men, many of the old restrictions had to be softened, admission to the novitiate, the novitiate itself, had to be made easier As a result, the inmates of many of the great monasteries at the time of the Renaissance were badly trained, came of poor stock, and had lost touch completely with the high ideals of their predecessors

We have only to look at our own country during the last war to see something of the same kind, although we were not in the war long enough to feel it very deeply After the armistice, the many hold-ups and robberies of the so-called "crime wave" were committed, not by ex-service men, who, after the excitement of the killing of the enemy, could not get over the desire to kill or to rob someone, but by half-grown youths who, during the war, had run amuck, whose fathers and big brothers—the representatives of home authority—had been away overseas, and who had earned disproportionately high wages in the munitions plants Germany suffered in the same way much more deeply, indeed, her final collapse is, I have often been told, directly attributable to the type of recruit that was called to the colors during the last year of the war These recruits were youths who during the first three years of the war had done as they pleased, whose homes had been swept clean of any restraining authority in the shape of parents, uncles, even grandfathers, and who had grown up to be lawless, selfish, disobedient When they were called to the colors and sent to the front, they ran away under fire, mutinied, shot their officers from behind It was, as General Ludendorf is said to have exclaimed, "a material from which soldiers could not be made" And when this material was all that he had, the end of Germany's resistance had to come sooner or later

It was not only the black death, however, that helped to weaken

men available to many and scattered the seeds of their new teaching in great handfuls, instead of sowing one seed at a time—the only method available in an age of scribes and manuscripts

Perhaps there is no pleasanter way—though there may be many a better one—of getting the "flavor" of the Renaissance than to consider, briefly, two representatives of this new type of thinkers and teachers And then to meditate, briefly also, upon two books, which are distinctive of the Renaissance and are impregnated with its atmosphere.

Two men, then, and two books Two lives, and the products of two other lives Paracelsus and Vesalius "The Colloquies of Erasmus" and the "Epistolæ Obscurorum Virorum"

There is little in common between Paracelsus and Vesalius except that, in a sense, both were rebels against the "medical traditions of the elders" But their rebellion expressed itself in utterly different ways Paracelsus was like the famous Irishman who "did not know what the government was," but whatever it might be, he was "against it" His rebellion was an expression of his innate characteristics He rebelled not only against Hippocrates and Galen, but against moral standards and against all authority At least that is the impression that he made upon his contemporaries They admit that he cared nothing for women, although he "had every other vice", but they ascribe his sexual frigity to physical causes For one of his enemies, Erasmus says that he had lost his testicles at the age of three, having been castrated by either a soldier or a wandering pig[9] There was a rough, coarse violence about his language at times that makes one suspect too much alcohol The modern historian, then, thinks of him as a remarkably gifted personality, who suffered from boyhood from a sense of inferiority, and who in manhood "over-compensated" for this inferiority sense by his rebellion, by his rough abuse of authority, and above all by his alcohol-

[9] "Paracelsum trimum a milite quodam, alii a sue exsectum ferunt, constat imberbem illum, mulierumque osorem fuisse." The story of the pig is almost surely a lie It is still told, in various forms, in Italy to-day In Rome, I have myself heard it said that, if it were not for the hungry pigs that wander about the houses of poor Italian families, the Pope would be hard put to it to get male sopranos for St. Peter's choir as the Church forbids castration for "vocal purposes."

Fig 1

A comparatively early portrait of Paracelsus Even in this portrait one notices the hand laid upon the round pommel of the sword in which Paracelsus was supposed to keep his most secret drugs

Fig 2

Also an early picture of Paracelsus, at present in the Paris Louvre

Fig 3

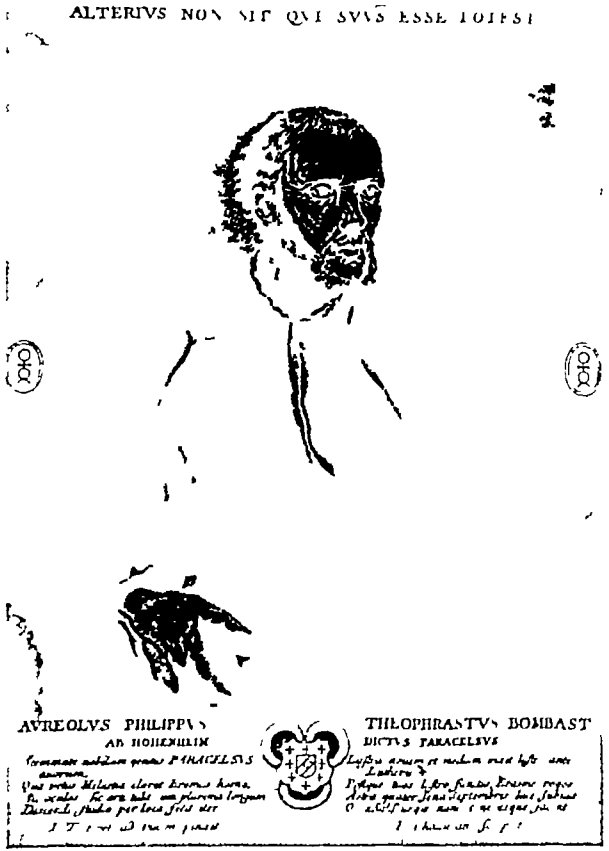
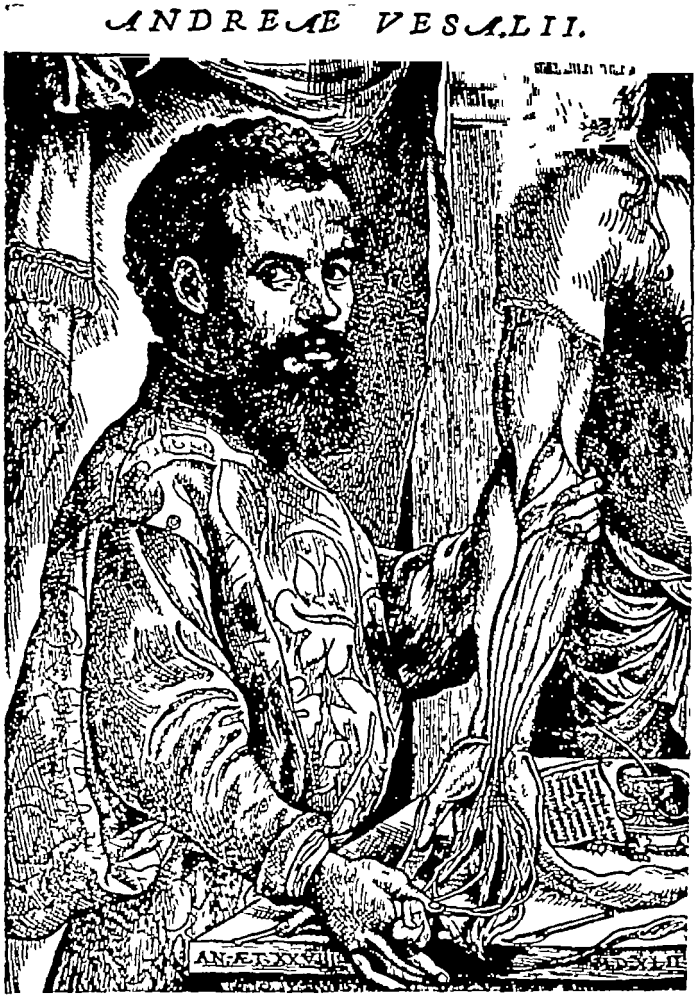


Fig 4

Abb 143 Hohenheim 1540 ein Jahr vor seinem Tode gezeichnet wie nach dis vorige Bild von Augustin Hirschvogel

Figs 3 and 4 were made in the later years of Paracelsus life—the last one having been engraved only a year before his death i e in 1540 Fig 3 is the frontispiece of Paracelsus Opera Omina Fig 4 is taken from Professor Sudhoff's Geschichte der Medizin im Ueberblick

Fig 5



The famous woodcut of Andreas Vesalius taken from the frontispiece of the first edition of the De Fabrica drawn by Stephen van Calcar

ism Like so many others of his type, alcohol gave him the sense of equality or of superiority that temporarily abolished his inferiority complex Hear one excerpt, addressed to his medical colleagues "Against you and all your authorities, Avicenna, Galen, Aristotle, I know that I am fully armed This bald and hairless head of mine knows more and higher things than your Avicenna or your whole Academy Come on, get up say something. Show that you are men and can defend yourselves What, you still sit still, learned doctors and masters, pretending to search for fleas or scratching your backsides?"

Whether such were actually the words of Paracelsus I do not know The fact remains that the general impression that he left upon his contemporaries was an unpleasant one. No one denied that he was a great man No historian to-day thinks of questioning the immense value of his services to medicine in allying it with chemistry But the fact remains that he was a kind of "uncomfortable person" to have around Whoever was not with him was against him. And he made intensely bitter enemies Take even that great-hearted, kindly souled man, Conrad Gesner He was born in 1516 and would have been about twenty-four when Paracelsus died in 1541 In his "Medical Epistles"[10] he writes "Theophrastus vero certe impius homo et magus fuit et cum dæmonibus communicavit." In other words, Paracelsus seemed to Gesner so impossible that Gesner could only explain his actions by assuming that he was possessed of the Devil

There is, however, an unhappy sense of unexpressed greatness, of mighty aims unachieved about the life of Paracelsus His portraits show it.[11] Compare the early picture[12] with its far-seeing eyes, powerful nose and sensitive mouth with the portrait at the Louvre, in which the finer lines of the face are beginning to be lost in the smoothness, the handsome puffiness of too much good food and too much wine And finally, look at the two older portraits, in which there seems to remain nothing at all of the grace and power of the

[10] "Epistolarum Medicinalium Conradi Gesneri, Philisophi et Medici libri iii" Tiguri excudebat Christoph Frosch, 1527, p 2, recto

[11] See the four portraits in illustrations to this paper

[12] Taken from Professor Sudhoff's translation of the "Complete Works," 7th volume, Munich, 1923

earlier pictures Here, at the last, is a hardened, thin, bitter man, old before his time Only the eyes look out on the world with the same defiant interest.

He was unusually small, very delicately built, and had a very high, thin voice He was, says Dr Bernhardt Aschner, in his first volume of a German translation of Paracelsus' works [13] "not over 150 cm high, had no attraction towards the female sex, and was of a very choleric and emotional temperament"

Although modern scholars, above all others Professor Sudhoff, have done much to clean away from the traditional portrait of Paracelsus the old false accretions of scandal and enmity, and to show us the man, as he really was, yet, for me at least, and for those of us who have always a lingering respect for the most outworn authority, Theophrastus still leaves "a bad taste" in the mouth I sympathize with the way that Conrad Gesner felt. The kindest thing that you can say about Paracelsus is that, at times at least, he must have been a kind of Gardarene swine, possessed by the Devil and rushing down into the sea to his own destruction.

When we turn, however, to Andreas Vesalius, the atmosphere that surrounds him is cleaner, finer, more manly It is tainted, I admit, with rebellion and sometimes with angry disappointment But the rebellious elements have been greatly exaggerated And after all, Vesalius is a *gentleman* always If he differs from you, he does not call you names, and allude to your fleas or your backside He does his best to state in clear Latin the exact reason why he differs from you. And even when he sees himself forced to part company with medical tradition, he makes it a polite bow and, as he goes on his own way, salutes his opponent respectfully Paracelsus

[13] "Paracelsus saemtliche Werke," herausgegeben von Dr Bernhardt Aschner, Jena, Gustav Fisher, 1926, p 35 Much new light is thrown on the personal characteristics of Paracelsus by his so-called "Defences" published three years before his death in 1538 He wrote them apparently from a desire to justify himself in his own eyes and in the eyes of the world The sixth defence is especially interesting and is entitled, "The sixth defense to excuse himself for his peculiar and choleric temperament" A facsimile of this important Paracelsian work has been published by Prof Henry Sigerist in 300 numbered copies which were sent to members and friends of the Institute for the History of Medicine in Leipzig This facsimile was received by the writer too late to be incorporated in this present paper

spits in his face, and would not be above kicking him, when his back was turned That is the difference between the two men

This attitude of Vesalius can be satisfactorily illustrated by the manner in which he differed from Galen about the presence of "pores" in the intraventricular septum of the heart. If no such pores existed, then Galen's age-long, accepted theory of the passage of the blood from one ventricle to the other must be false

A great deal has been written about Vesalius But there be not many who really read him It is so much easier to write emotionally about this medical Theodore Roosevelt, who "cast the Galen-idol down" from its pedestal As a matter of fact, his personality was much more revolutionary than his books He might, in his anatomical demonstrations, prove Galen absolutely mistaken, but, when he came to put his findings into print, he, like a wise man, was cautious One cannot help but feel that the antagonism that he aroused, in Paris and elsewhere, was the result rather of his utterances in the dissecting room than of his printed words One hears in so many medical histories of the storm of antagonism that was created among the Galenists by the publication of Vesalius' "De Fabrica" in 1543 Yet, if one reads at least parts of this same book, one cannot help wondering at such a result of its publication, one cannot help doubting whether the "De Fabrica" were really the cause of all the outcry The second edition, published in 1555, carries the question as to the non-existence of the intraventricular pores a step further But even here the language is very moderate It is true that in Vesalius' "Epistle on the China Root," published in 1542, a year before the first edition of the "De Fabrica," the writer's anti-Galenic attitude is much more clearly and fearlessly expressed than in the larger, later work. But this little epistle cannot have had a great circulation [14]

[14] I am indebted to Col. Fielding H Garrison, the "doyen" of our corps, for the following valuable note, which reached me too late to be included in the body of this paper "The China root epistle contains Vesalius' most thorough-going exegesis of Galen, and the most interesting sidelights of his life It has never been Englished but there is a Dutch version in 'Opuscula Selecta Neerlandica,' Amst, 1915, vol iii You will find most of the Galenic references in the 'De Fabrica' in the footnotes of Roth's 'Vesal,' Berlin, 1892 Better use the second edition of the 'De Fabrica' of 1552–1555 rather than the editio princeps of 1543 for in the second most of the best work of Vesalius is to be found."

As a matter of fact, it was not the "De Fabrica," not the book but the man, with his powerful, flaming personality, that, like a counter-irritant, brought out the bitter recriminations of the conservative medical world The guarded language of both editions of the "De Fabrica" prove this, I think. It shows, especially that of the second edition, that we must separate Vesalius' anatomy from his physiology As an anatomist, he doubted the existence of the intraventricular pores of the cardiac septum, but as a physiologist, he still held fast to Galen's doctrine of the passage of the blood from one ventricle to the other His attitude, in this matter, is the most astonishing example of the dominating authority of Galen. Even so great a man as Vesalius accepted the general dogma, although he could not understand how it could possibly be true "Credo quia absurdum est"

Let us, briefly, compare a few passages of the first and second editions of the "De Fabrica"

First edition, 1543,	Second edition, 1553–1555,
book vi, chap 1, p 570	book vi, chap 1, p 709
Respiratio et sanguinis ex dextro cordis ventriculo in sinistrum assumptus,	Respiratio et sanguinis ex dextro cordis ventriculo in sinistrum assumptio, *quamtumvis interim hæc nobis sit obscurissima,* (Italics are mine)

First edition,	Second edition,
book vi, chap xi, p 589	book vi, chap xi, p 734
Ex his foveis (*i e*, the deep folds in the septum) nullæ [quod sensu saltem comphrendi licet] ex dextro ventriculo in sinistrum penetrant, adeo sane ut Rerum Opificis industriam mirari cogamur, qua per meatus *visum fugientes* ex dextro ventriculo in sinistrum sanguis resudat.	Utcumque interim hæc foveæ sint conspicuæ, nullæ tamen, quod *sensu comphrendi* potest, ex dextro ventriculo in sinistrum per eorumdem ventriculorum septum permeant. Neque etiam *mihi meatus vel obscurissimi occurunt, quibus ventriculorum septum sit pervium*

In the first edition, then, Vesalius speaks of the "assumed respiration" of the blood from the right into the left ventricle, while in the second, in parenthesis, he admits that this "respiratio" is "obscurissima" In the first edition, he speaks of the "meatus" or pores, by which this "respiratio" takes place, as being "beyond the power of vision," "visum fugientes", while in the second, he admits that

he himself has never come across even the most hidden "meatus" of this kind

Yet in another passage, he speaks of the "pores" as existing.

First edition, book vi, chap xv, p 598	Second edition, book vi, chap xv, p 745
He is describing the right ventricle, which is "dilated" by the vena cava, and draws the blood into it. This ventricle "maximum portionem (sanguinis) per *ventriculorum cordis septi poros* in sinistrum ventriculum desudare sinit."	Exactly the same words.

Finally, there is an illuminating passage in the second edition that does not appear in the first at all This is found in book vi, chapter xv, page 746 The first edition, in this place, same book, same chapter, page 599, gives the traditional Galenic description of the blood flowing to the brain, there to receive the "spiritus animalis" The second edition, at this point, has this passage

In cordis itaque constructionis ratione, ipsiusque partium usu recensendis, magna ex parte *Galeni dogmatibus sermonem accomodavi*, non sane, quod undique hæc veritati consona existimem, verum quod in novo passim partium usu officioque referendo, *adhuc mihi diffidam, neque ita pridem de mediocorum principis Galeni sententia vel latum unguem hic declinare ausus fuerim*

He goes on to say, however, that he has found the substance of the septum so thick, that "he does not know exactly how even the thinnest liquid could be taken through it." [15] And yet, just before, he has asserted, with all the weight of his own authority, that he has no intention of departing from the teaching of Galen, that prince of physicians, by even a hair's breadth.

The more one reads the "De Fabrica," the more one is impressed by the scientific objectivity, the gentlemanly restraint of the writer He knew his anatomy, at first hand, what he has seen or not seen, he tells you frankly But he is still enthralled by the towering authority of Galen In spite of the witness of his own eyes, he will not doubt the general theory, even though he cannot grasp the facts on which it is built. He preferred to doubt his own eyesight rather than impugn his master's authority At least that is how

[15] "Septum, ipsumque sinistri ventriculi dextrum latum, quod æque crassum compactumque ac densum est—adeo ut ignorem—qui per septi illius substantiam ex dextro ventriculo in sinistrum vel minimum quid assumi possit"

he appears to us in the pages of the "De Fabrica" We may sum up his attitude as follows As an anatomist, he questioned Galen's basic facts, as a physiologist, he accepted the dogmatic teaching which Galen had built on the same facts that Vesalius himself questioned

The "De Fabrica" is not interesting reading As I have said already, Vesalius himself must have been much more stimulating than his books It could scarcely have been the "De Fabrica" that set almost the whole of medical Europe against him, until he was a sort of medical Athanasius, "Vesalius contra mundum" It must have been his personality, the flame of his rebellion against mistaken tradition, that was often smothered under the restraint of the printed word, but that must have burst forth in his teaching and his talk In medical history, Andreas Vesalius is not the only great man who is more interesting than his book.[16]

During the Renaissance many highly individualized personalities stand out in medical history, but the general background of medical practice against which they appear is nothing new or wonderful The level of our profession, at that time, was no better, if as good, as it had been during the Middle Ages In England, until Thomas Linacre founded the Royal College of Physicians in London, in 1518, there had been no real effort to keep unworthy men out of our profession The experiences of the public, during the black death and the Sudor Anglicus, or with syphilis, had shown the layman how helpless the physicians were, even when, occasionally, they were dutiful and untiring John Securis, in his "Detection and Queremony of the Daily Enormities and Abuses Committed in Physick," [17] gives us a most distressing picture While Thomas Gale, an old military surgeon, says that in 1544, during a campaign of Henry VIII, "There was a crowd of rascals that pretended to be surgeons Swine and Horse-gelders, Cobblers and Tinkers were all mixed together These fine fellows, that were commonly called 'dog-leaches,' accomplished such cures that their wounded never needed more than one or two bandagings and never afterward com-

[16] For an interesting study of this whole question see "Zur Geschichte der Physiologie des Blutumlaufes," Inaugural Dissertation, von Dr Karl Koester, Tuebingen, bei H. Laupp, 1915

[17] London, 1566

plained of Pain, Cold or Heat, for many such soldiers simply perished of very light wounds" [18]

In conclusion, let us turn, for a moment, from the two men, whom we have selected from among the many great individualities of the Renaissance, to two books, that were even more powerful, in their way, than either Vesalius or Paracelsus himself Books that during the Renaissance were in the hands of everybody, and that spread far and wide the mental atmosphere of their authors Books that kept on being read long after the upheavals of the Renaissance had quieted down, and that are still enjoyed to-day by anyone who loves brilliant writing and mordant humor

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[18] John Aikin, "Bio Memoirs of Med. in Great Britain," London, 1780

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[20] See INTERNATIONAL CLINICS, series 37, vol iv, p 247

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The "De Fabrica" is not interesting reading As I have said already, Vesalius himself must have been much more stimulating than his books It could scarcely have been the "De Fabrica" that set almost the whole of medical Europe against him, until he was a sort of medical Athanasius, "Vesalius contra mundum" It must have been his personality, the flame of his rebellion against mistaken tradition, that was often smothered under the restraint of the printed word, but that must have burst forth in his teaching and his talk In medical history, Andreas Vesalius is not the only great man who is more interesting than his book.[16]

During the Renaissance many highly individualized personalities stand out in medical history, but the general background of medical practice against which they appear is nothing new or wonderful The level of our profession, at that time, was no better, if as good, as it had been during the Middle Ages In England, until Thomas Linacre founded the Royal College of Physicians in London, in 1518, there had been no real effort to keep unworthy men out of our profession The experiences of the public, during the black death and the Sudor Anglicus, or with syphilis, had shown the layman how helpless the physicians were, even when, occasionally, they were dutiful and untiring John Securis, in his "Detection and Queremony of the Daily Enormities and Abuses Committed in Physick," [17] gives us a most distressing picture While Thomas Gale, an old military surgeon, says that in 1544, during a campaign of Henry VIII, "There was a crowd of rascals that pretended to be surgeons Swine and Horse-gelders, Cobblers and Tinkers were all mixed together These fine fellows, that were commonly called 'dog-leaches,' accomplished such cures that their wounded never needed more than one or two bandagings and never afterward com-

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from Martial or Juvenal The Middle Ages could be brutally frank about the most secret matters But the "double-entêndre," the subtle suggestion, was practically unknown They could be downright brutal, or dirty, but they could not tell a smutty story and let the grade of smuttiness depend on the imagination of the reader. Neither were they clever in the art of climax, the sudden obtrusion, in the midst of chaste prose, of a coarse word. The thing that Martial excelled in

This new mental attitude crops out on the very first page of the "Colloquies" Even in the midst of the little treatise on "Salutations"

"It is," says Erasmus—mind you—to his little god-son, "polite to salute those who meet us To salute those who are eating, or at work or at leisure, even while they are gulping or coughing" But—"in ructu crepituve ventris salutare, hominis es plus satis urbani" "To salute a man, while he is breaking wind, is pushing civility to extremes" While "it is downright rude to salute anyone 'qui reddit urinam, aut alvum exonerat'"

All done in the most chaste Latin but with your tongue in your cheek.

Remember Erasmus was the most celebrated scholar of his time, his influence was unbelievably great, he was in Holy Orders, although he kept this fact in the background And yet, during the Renaissance people saw nothing unusual—at least the greater part of the public did not—in such a Colloquy as that between Lucretia—the very name is a side-splitting jest, the "scortum"—"prostitute" is too mild a word by which to render the Latin—and Sophronius the Youth It is true that one or two carping critics did object to Lucretia's addressing the young man as "mea mentula" Erasmus might have pointed out that, in the English drama, youths are sometimes called "My young Cock." And the reference intended is not to the husband of the hen either

There is no end of interesting medical material in the "Colloquies," if anyone would take the trouble to dig it out The "Ichthuophagia," or the "Fish-eaters," is full of it Erasmus hated fish with a holy hatred, and one of his greatest difficulties was to avoid the eating of it on fast-days without giving offense It is typical of the Renaissance that his criticism of the monks, his jovial pagan-

ism, his rather lax dogmatic outlook did not give half the annoyance to his friends that was caused by his fish-phobia, even though he had a dispensation from the keeping of Fridays [21] In the "Fish-eaters," he takes his revenge on "Ichthus" by insisting that fish, as food, is poisonous The dialogue is supposed to take place between a butcher, "Lanio," and a fish-seller, a "Salsamentarius" Says the butcher,[22] "By the eating of fish, men's bodies are filled with putrid humors, from whence proceed fevers, consumption, gouts, falling-sicknesses,[23] leprosies and what not of diseases" [24] The butcher answers, "Dic igitur mihi, Hippocrates, etc," calling the fish-monger Hippocrates, not only because he seems to know the names of so many diseases, but because he speaks of "putribus humoribus," for Erasmus evidently knew that the origin of the "Humoural Pathology" goes back to the Father of Medicine A little further on we get a sidelight on the treatment of epilepsy, a disease in which Erasmus seems to have been especially interested The butcher has said that people who eat fish get to look like fish They are "pale, stinking, stupid and mute" [25] The fishmonger replies that people who feed on the flesh of sheep, mutton and goats, become like oxen, sheep and goats themselves He adds, "You sell kids for a mighty delicacy, and yet this creature is very bad for the falling-sickness, and brings that distemper upon flesh-eaters" [26] In epilepsy, therefore, according to the belief of Erasmus' day, the goat is not organo-therapeutic but organotoxic Epilepsy, in Latin, is called the "morbus comitialis" for a rather interesting reason. The Comitium

[21] I remember a similar situation that I once met with in China some twenty years ago A Chinese servant, a descendant of a long line of Christian Chinese, whose remote ancestor had been converted by the early Jesuit missionaries, had been engaged as butler by the American Minister in Peking He was proud of his new position, until—the first Friday Then he came to me in tears, assuring me that he must leave this American house, because it was no place for a Christian The Minister was not a Christian He *could* not be "Christians," said the Chinese butler, "do not eat meat on Fridays"

[22] About the third page of the dialogue In Bailey's English translation, p 259

[23] Epilepsy

[24] "Ex piscium enim esu corpus impleri putribus humoribus, hinc febres, tabes, podagræ, epilepses, lepræ et quid non malorum"

[25] Bailey, p 260 "Pallent, olent, stupent, muti sunt."

[26] Bailey, p 260 "Tamen hoc animal [*i e*, Hædi, goats] morbo comitiali obnoxium, ita gignit eundem morbum"

was first a part of the Roman Forum in which the regular meetings of the people were held, later, the word was used to denote the meeting itself and meant a legally called and legally held assembly of the entire Roman people, in order to make or abrogate laws, to bestow honors or to hear and decide capital cases If, on one of the days assigned to such an assembly, or during the assembly itself, anyone of the assembled voters had an epileptic seizure, this was considered an evil omen, and automatically suspended the assembly

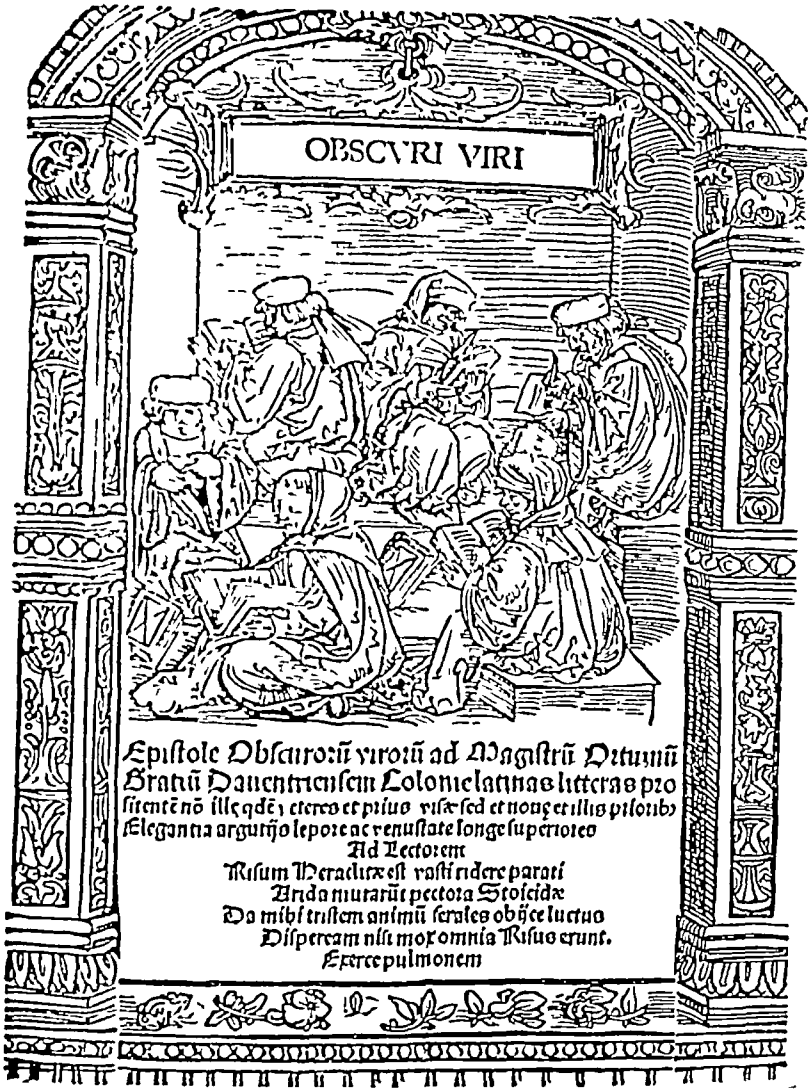
The "Colloquies" also contain a good deal of sound advice to patients In the "False Knight" or "Hippeus Anippos,"[27] Nestor asks the young man who wants to assume a pretended noble lineage, "Were you born in some distinguished city?" And the young man answers, "No, in a small unknown village When you go to ask advice of a physician, there is no sense in lying" "Non enim fas est ei mentiri unde petis medicinam" Many a patient might take these words to heart.

Still more interesting than the "Colloquies" is that strange book called the "Epistles of Obscure Men," published anonymously, either in the late months of 1515 or early in 1516[28] The first and second editions contain only forty-one letters, but after a few months a third appeared with an appendix of seven new letters Later editions were still more enlarged It is said that when Erasmus first read the book, "he fell into such a fit of laughing that an abscess in his face burst, which else should have had to have been laid open by order of his physician" The authors of the book have never been surely known But it appears almost certain that the book was the work of two very unusual men, Crotus Rubeanus, whose German name was Johann Jaeger, and Ulrich von Hutten[29] The "Reuchlin affair,"

[27] Bailey, p 330

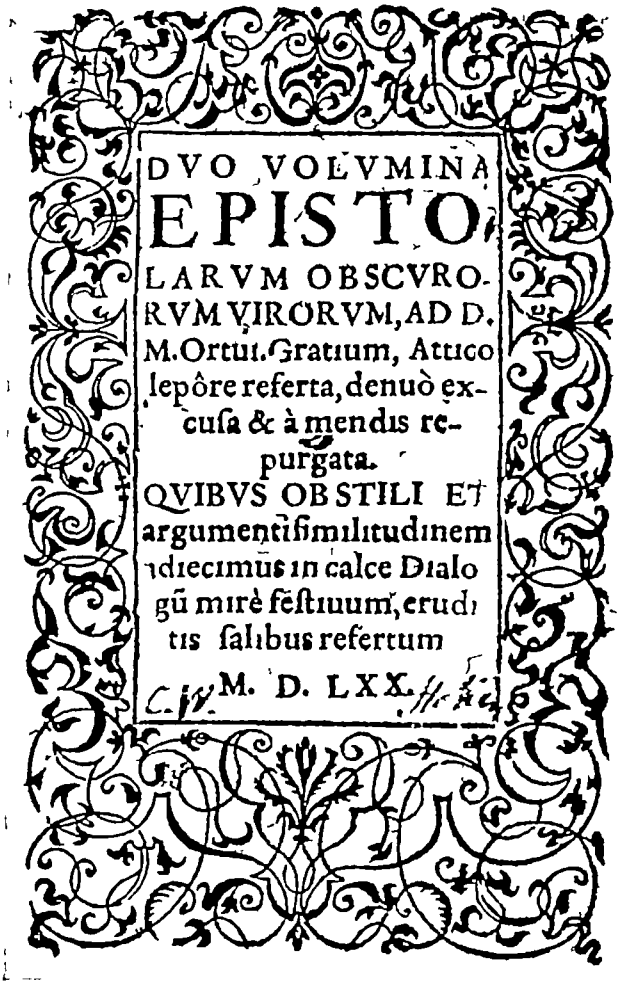
[28] "Epistolæ Obscurorum Virorum ad Venerabilem virum Magistrum Ortuinum Gratium Daventriensem Coloniæ Agrappinæ bonas litteras docentem. Variis locis et temporibus missæ ac demum in volumen coactæ"

[29] See the discussion as to the authorship in "Epistolæ Obscurorum Virorum" The Latin text with an English translation, notes and historical introduction by Francis Griffen Stokes, London, Chatto and Windus, 1925, pp lvi ff The best critical edition of the "E O V" is to be found in the complete works of Ulrich von Hutten "Ulrichi Huttenii Equitis Operum Supplementum Epistolæ Obscurorum Virorum cum inlustrantibus adversariisque scriptis collegit recensuit adnotavit Edwardus Boecking," Lipsæ, in aedibus Teubnerianis, 1864, three volumns



The frontispiece from the first edition of the second part of the "Epistles of Obscure Men" published about 1517

FIG 7


DVO VOLVMINA
EPISTO
LARVM OBSCVRO-
RVM VIRORVM, AD D.
M. Ortui. Gratium, Attico
lepôre referta, denuò ex-
cusa & à mendis re-
purgata.
QVIBVS OB STILI ET
argumenti similitudinem
adiecimus in calce Dialo
gũ mirè festiuum, erudi
tis salibus refertum
M. D. LXX.

The first page of a small duodecimo edition of the letters published in 1570 The colophon this and of previous editions is an imaginary one and reads published at Rome by permission the Pope confirmed by him in the room which is commonly called 'The Belvedere

from which the book sprang, was, in its time,[30] as famous as the French "Affaire Dreyfus" once was, in our own days John Reuchlin, or, as he "grecianized" his name, "Campnion," was indisputably the most learned scholar in all Germany during the early years of the sixteenth century He was not only a scholar, a humanist, but also a man of affairs, a jurist, and, above all, a pioneer in oriental literature An able man, but a simple, kindly soul forced by circumstances into the midst of a nasty fight that his soul abhorred, a fight, not of his own choosing, against the reactionaries of his day, against the extreme conservatives in scholarship who still held fast to the mediæval traditions of Scholasticism and who distrusted the "New Learning" because they had not the ability or the elasticity of mind to adapt themselves to it They made the fundamental, the disastrous mistake of believing that every iota of their system was of divine origin, that no jot or title of it could be assailed without imminent danger to the "Christian Faith" and that anyone who pointed out, in the light of original research, any obvious mistakes in the ponderous superstructure, which Scholasticism had built upon the fundamentals of the Christian religion, was a heretic and an enemy of Catholic Christianity itself Because of this attitude, they forced the men, who were basicly good Catholics but who could not help pointing out manifest errors in traditional theology and scholarship, into a position of antagonism to the entire Catholic system There were but few men who, like Erasmus, could uphold the cause of the New Learning, and, at the same time, remain faithful to the Catholic Church The most conservative of all the conservatives were the monastic orders, especially the "Mendicant Orders", and of these ultra-conservatives there was one especially active group in the Theological Faculty at Cologne, most of them Dominicans In this group was a doubtless, estimable "Master of Sacred Theology," one Ortuin Gratius, to whom the imaginary letters of the "Epistolæ Obscurorum Virorum" were supposed to have been written Arnold of Tongern, a rather lady-like professor, was another member of this group, who were all highly approved of by Jacob von Hoogstraten, himself a Dominican, and "Inquisitor of Heretical Pravity" for the diocese of Cologne

The trouble all began with a converted Jew, named Johann

[30] 1509–1520

Pffercorn, who is said to have embraced Christianity in order to escape the penalty of his crimes He had been a butcher and, "on the side," a burglar Erasmus said of him "ex scelerato Judæo sceleratissimus Christianus," that is, that he had been a bad Jew and had become a still worse Christian In 1509, Pffercorn secured an introduction to the vascillating Emperor Maximilian. Just after his "conversion" Pffercorn published an anti-semitic pamphlet called "Der Joeden Spiegel," followed by a Latin version of the same Now Pffercorn was illiterate, he could not write German, much less Latin, and it soon became evident that the Dominicans at Cologne, especially Ortuin Gratius, had written most of the pamphlet for him A number of other anti-semitic publications followed Finally, Maximilian was persuaded to issue an edict, providing that all Jewish books and manuscripts, excepting the Old Testament, were to be publicly burned Oriental scholars were up in arms at once, with Reuchlin in the lead The Emperor's edict would mean the destruction of many precious manuscripts of Talmudic and Rhabinic literature Reuchlin had already published a Hebrew grammar, he was a distinguished Orientalist, and he was asked by the Emperor to serve on a Royal Commission which was to minimize the extension of the edict and to determine which of the Jewish books ought to be burned, and which might be preserved His confidential report somehow got into the hands of the Dominicans at Cologne, and, doubtless assisted by them, Pffercorn published a furious attack on Reuchlin in 1511, in his "Handt-Spiegel" Now the fight was on to a finish The Dominicans were out to ruin Reuchlin. But he had powerful friends, in England, Sir Thomas Moore, Linacre, the great scholar and physician, Colet, Dean of St Paul's, Fisher of Rochester, and many others Interest in the case spread all over Europe It was to be a fight-to-the-finish between the hard-headed die-hard conservatives, represented by the Cologne Faculty, and the defenders of the New Learning, Reuchlin, Erasmus, and the Humanists The case was finally carried to Rome, before the Papal Curia Leo X was asked to pronounce whether Reuchlin were a heretic or not Money was spent by both sides, although the Reuchlinists had very little to spend And Reuchlin himself was reduced to poverty and died an unhappy, broken man

In 1513 Reuchlin had published a small collection of letters that

had been written to him by distinguished men, calling it, "Clarorum Virorum Epistolæ—variis temporibus missæ ad Iohannem Reuchlin LL doctorem" Late in 1515 while the Reuchlin case was still pending at Rome, a little book appeared called "Epistolæ Obscurorum Virorum," purporting to be letters written to Dr Ortuinus Gratius by his various admirers

It took Europe by storm The letters were written in the most execrably bad Latin—the Latin that was used by the ordinary priest or monk for his general correspondence And the sidelights that they threw on the lives of Ortuin and Arnold of Tongern, on Hoogstraten and his satellites are side-splitting Of course, there was probably no definite truth in many of the statements But Ortuin Gratius lives forever in the minds of men because of the picture given of him in these imaginary letters And they proved one of the most powerful weapons in the hands of the Humanists, for a man, killed by ridicule, is dead indeed.

The medical material in the book is excessively interesting, and more than excessively amusing [31]

Here is the description, from one Ioannes Kalp—the names of the various correspondents are jokes in themselves—to Magister Ortuin, about "unum magnum animal" that the Pope had bought, and that he treasured greatly, and that was called "Elephas" [32] "The Pope held this animal in great honor and loved him very much Now you must know that this animal has died. When it was sick, the Pope was in great sorrow He called several physicians and said to them 'If it be possible, cure Elephas for me' Then the physicians, with great diligence, examined its urine, and gave it a purge that cost five hundred golden crowns, and yet they could not make Elephas' bowels move, so he died, and the Pope grieves for Elephas" [33]

[31] See for example, in the English edition of Francis Griffen Stokes, quoted above, pp xxiii and xxxviii And pp 7, 27, 35, 39, 64, 86, 90, 91, 100, 102–107, 109, 117, 135, 146, 148, 152, 159, 170, 187, 200, 233, 273

[32] Book ii, letter 48, Stokes edition, p 233

[33] "Et quando fuit infirmum, tunc Papa fuit in magna tristia. Et vocavit medicos plures and dixit eis, 'Si est possibile, sanate mihi Elephas' Tune fecerunt magnam diligentiam et viderunt ei urinam et dederunti ei purgationem quæ constat quinque centum aureos, sed tamen non potuerunt Elephas facere merdare, et sic mortuum Et Papa dolet multum super Elephas"

Here is another bit of medical advice, given to Magister Ortuin by Herbord Mistlader[34] Mistlader is anxious about Magister Ortuin, he has not heard from him for so long He writes "Tell me how you are I fear that you have a headache or a pain in your belly and loose bowels, such as you had on that day when you dirtied your drawers on the open street and did not perceive it, until a woman cried to you, 'Lord Master, where have you been sitting in s—t? Even your skirts and shoes are stained' Then you went into the house of Mr John Pffercorn, and his wife gave you other clothes You ought to eat hard-boiled eggs and roasted chestnuts and cooked beans sprinkled with poppy-seed I have dreamed a dream concerning you that you have a grievous cough, and much phlegm, eat therefor sugar plums and peas mashed with garlic Lay a roasted onion on your navel, and keep away from women for six days" The last, "for six days"—written to a celebate priest and a chaste monk—is a good example of the clever little digs that illuminate every page of these imaginary letters[35]

Such citations might be indefinitely prolonged, "ad gaudium magnum" of everyone who can read the simple, school-boy Latin One more quotation must suffice

Vilipatius de Antwerpia Baccalaurius writes to "amico suo singularissimo" Ortuin that he had a visit from a friend of "our Lord Jacobus de Hoogstraten," "Inquisitor of Heretical Pravity," and that he asked this visitor, "How does my dear friend, Magister Ortuin Gratius, from whom I learned much in Logic and Poetry?" The visitor answered that Ortuin had been ill Vilipatius goes on "Then, at this news, in terror I fell fainting at his feet He poured water over me and plucked me in my privy parts, and only with difficulty brought me to myself[36] Then I asked what your illness might be, and he said that your right pap was swollen, and that by

[34] Mist, in German, means "dung"

[35] "Timeo quod caput vobis dolet, vel quod habetis infirmitatem in ventre et estis laxus, sicut olim fuistis quando permerdastis caligas vestras in plateis et non sensistis, donec una mulier dixit, 'Domine magister, ubi sedistis in merdis? Ecca tunica et pantofoli vestri sunt maculata'—Ac ponite unum assatum cæpe ad umbilicum vestrum, et per sex dies debetis abstinere a mulieribus"

[36] "Me perfudit cum aqua frigida, et crinisavit me apud pudenda ["twitched my pubic hairs"], et vix suscitavit"

this painful infirmity you were troubled and kept from your studies Then I came to my senses and cried 'Ha, I can cure that ailment'

But Lord Magister, learn first whence this infirmity proceedeth When wanton wenches see a proper man like yourself, with auburn locks, and brown or hazel eyes and a fine nose and well-built withall (bene corporatus), then they yearn to possess him But when he is a moral man, and well learned like yourself, and pays no attention to their follies and wiles, then they take refuge in magic arts, and at night they sit on a broom-stick and come riding on the broom-stick to this comely man whom they desire, and they do their business with him while he is asleep, and he perceives nothing except a dream [37] And they suck the blood from his breasts, and sometimes they make this friend of theirs so weak that he can scarcely walk even with a stick" Then, this treatment for the swollen "mamilla" is advised "Upon a Sunday take some consecrated salt, and with it make the sign of the cross upon your tongue, and eat it as saith the Scripture 'Vos estis sal terræ,' which is by interpretation, 'Eat ye the salt of the earth'" (An example of how the correspondents of Magister Ortuin show their lack of education, by confusing the Latin words, *edere,* to eat, and *esse,* to be) "Afterwards make the sign of the cross upon the breast and again on the back, in like manner put some salt into each ear—taking heed that none fall out Finally recite the following devout prayer" (This is too good to try to translate)

> "Domine Jesu Christe, et vos quattuor evangelistæ,
> Custodite me a malis meretricibus, et ab ipsis incantatricibus,
> Ne exsugant meum cruorem et faciunt gravem dolorem
> In meis mammillis Quæso resistite illis,
> Dabo vobis offertorium, unum pulchrum aspersorium"

Finally comes a dig against Pffercorn.

"And how standeth it with Doctor Reuchlin? The Magisters here say that he is too much for you but I don't believe it Fare you well more than eternally Greet for me Mr Johann Pffercorn and his wife And tell them that I wish them more good nights than the Astronomers have minutes"

The "Epistolæ Obscurorum Virorum" is an essential product

[37] "Ad pulcrum illum virum quem amant, facientes negotium suum cum eo quando dormit, et nihil sentit nisi somnium" A pleasant explanation of an "emissio nocturna" for a chaste monk.

of the Renaissance It exhales the very atmosphere of those feverish days But besides all that, it remains a joy forever A hundred years ago, a copy of it stood among the best-beloved books of almost every man of wit and cultivation In our times, it has fallen upon forgetfulness Yet anyone who cares to redeem it, temporarily, from oblivion will be more than repaid For there are ten thousand more laughs in its pages than in endless volumes of *Punch*, of *Life*, or even of *College Humor* And the Latin is so vile that even those of us whose Latin is confined to the occasional writing of a prescription can understand and chuckle over it.

Two men, Paracelsus and Vesalius, and two books, the "Colloquies" of Erasmus, and the "Epistolæ Obscurorum Virorum" If we really read what these two men wrote, if we can recapture the atmosphere in which these two books were written, we may be able in some measure to appreciate the years of the Revival of Learning, and so to understand how the ordinary medical man of those same years reacted to the unstable environment into which he was born In medical history, as I have said, there are many outstanding personalities—many men of genius during the Renaissance And it was all stimulating enough, perhaps, for the Linacres, for the Vesaliuses and the Paracelsi—but how about the ordinary plodding general practitioner? Did his age seem to him so marvellous as it appears to us? I doubt it. The best that such a minor practitioner could hope for, was to become attached to the court of some small prince, at Ferrara, at Este, or in a hundred other centres of excited magnificance But to be attached to such a court meant, for a physician, the learning of family secrets And, during the Renaissance, people who knew many secrets did not live long

Medical Questionnaires

In Doctor Lintz's paper in the last issue upon "Consideration of High Blood-pressure, Small Lungs," upon what facts did he base his findings that high blood-pressure is often due to small lungs?

Careful X-ray studies were made of the patients under observation, a measured ruled screen (Fig 1) being introduced so that the squares were printed on the photographic plate as well as the shadows themselves Figs 2–7 are samples of the 100 or so of cases which Drs William Lintz and S Weinstein studied by this method.

What is the treatment of hiccough with carbon dioxide?

R. F Sheldon in the *Journal of the American Medical Association* (October 1, 1927, p 1118) considers hiccough to be a spasmodic contraction of the diaphragm in which the cause is probably an abnormal stimulation of the respiratory centre, either by direct action or through the afferent fibres in the phrenic nerve The surgeons have learned that 5 per cent of CO_2 in the inspired air is the most effective means at our command, in increasing the depth and the strength of respiration With such a stimulus the hiccough should cease as soon as the respiration becomes uninterrupted Doctor Sheldon has tried out this method in eleven cases in which seven of them suffered from hiccough following laparotomy The carbon dioxide was inhaled from one to twenty minutes, the hiccough usually being controlled within two to five minutes, and if the hiccough returned one or more times, the inhalation was resumed Only one of the cases did not yield to the treatment and in another of the patients, the maximum number in a day was 36 As carbon dioxide causes an increase of blood-pressure, respiratory effort and some exhaustion, the treatment should not be used in very debilitated patients and in those instances when the stomach and gall-bladder are involved it may be a choice between the chance of increased hemorrhage or the danger arising to these organs from the hiccough itself Should hiccough develop during anæsthesia, the amount of carbon dioxide necessary may be administered by the simple method of making the patient rebreathe his expired air

Is there any new treatment of ozæna other than the ones found in the latest text-books?

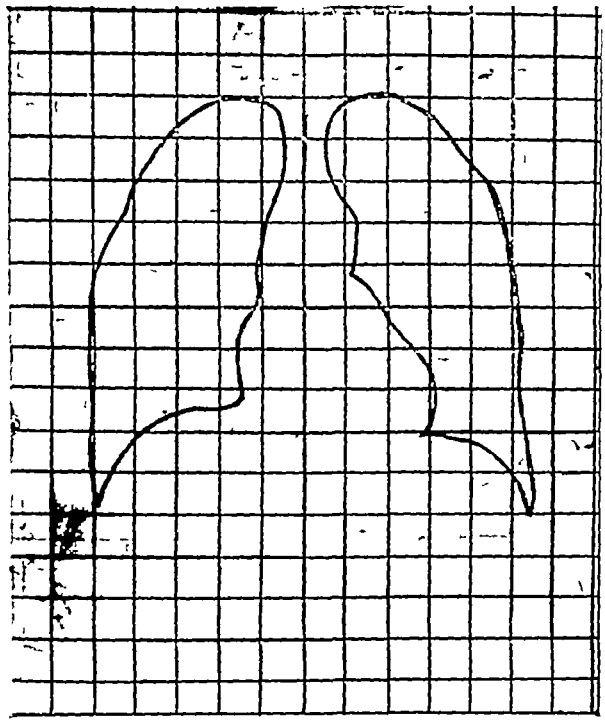
Stefanoff, *Munchener medizinische Wochenschrift,* November 18, 1927 (noting Kaglingen's method, *Med Kl*, Nr 30, 1927, of treating tuberculous ulcers with insulin), has found insulin of value in handling cases of ozæna The treatment consists in a daily single application of a plug of cotton to the nose made up of iodoformized gauze dipped in 10 I E of insulin In a short time the tenacious fluid becomes more liquid and the odor quickly disappears The application gives no pain and avoids the giving of the insulin by injection The insulin might also be introduced in the form of salve

What is the present treatment of black water fever?

Nocht, of the Hamburg Institute for Tropical Diseases, made a report on sixty cases of black water fever in 1905 Not much new information has been gained since Treatment is symptomatic mainly, even at the present time The clinical symptoms have not been developed further by pathologists than they were in 1905 The features still quoted are chills and temperatures, followed by severe hemolysis and subsequent hemoglobinuria, which must be considered signs of existing malaria, and which are generally brought out by quinine Tropical malaria infection has been seen in 96 per cent of the cases of black water fever, while only 3 per cent had tertian, and 1 per cent quartan types (Thomson) Patients may tolerate quinine well when it is administered later in the disease Reznik uses intravenous injections of anti-hemolytic serum, Trout anti-hemolytic or horse serum, and he has had no fatal cases since adoption of this therapy Schafer had good results from novasurol injections, Facio and Rojas recommended intramuscular injections of caffein sodium benzoate, Matteo 100 c c of a solution of 2 5 per cent disodium phosphate and physiological saline, equal parts Not only the symptoms of black water fever, but also the malaria must be treated

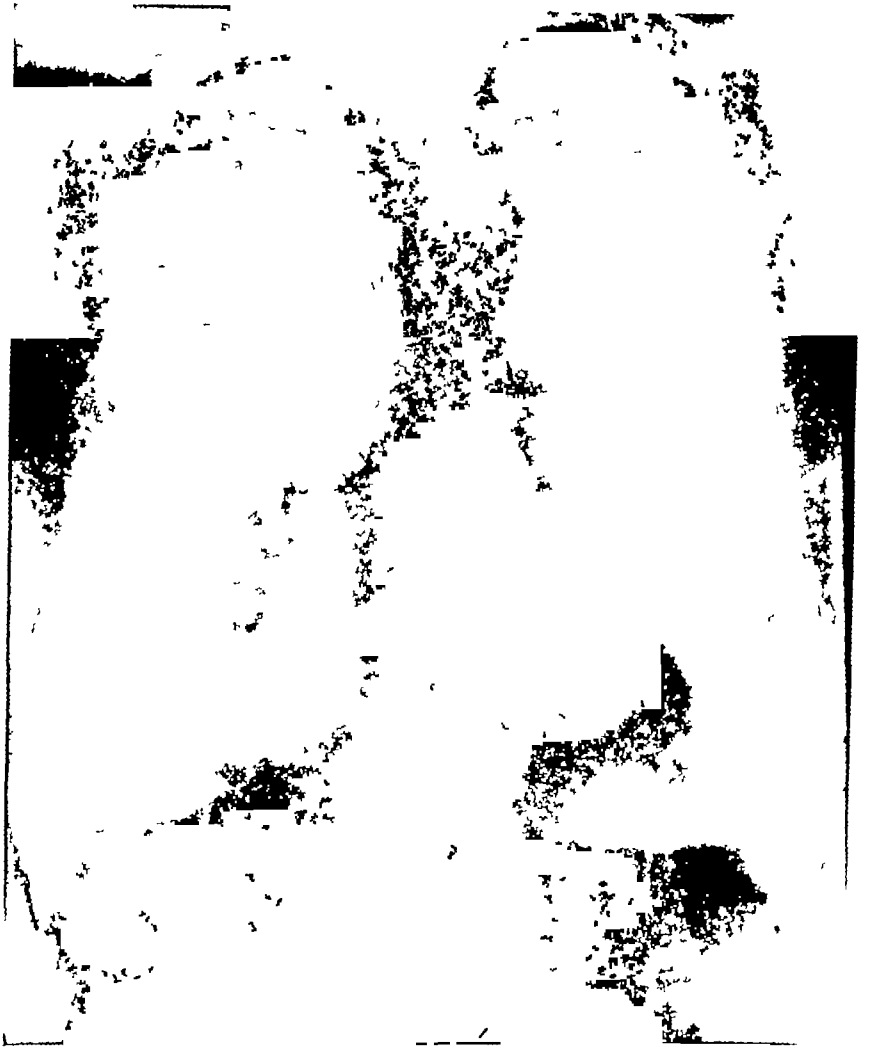
Kikuth, Walter "Present Knowledge of Blackwater Fever, with Own Experimental Observations," *Arch f Schiffs Tropen Hyg*, Leipzig, vol 31, H 1, 1927

Fig 1



To estimate the size of the lungs the X-ray films were superimposed upon ruled squares which were counted parts of squares were included

Fig 2

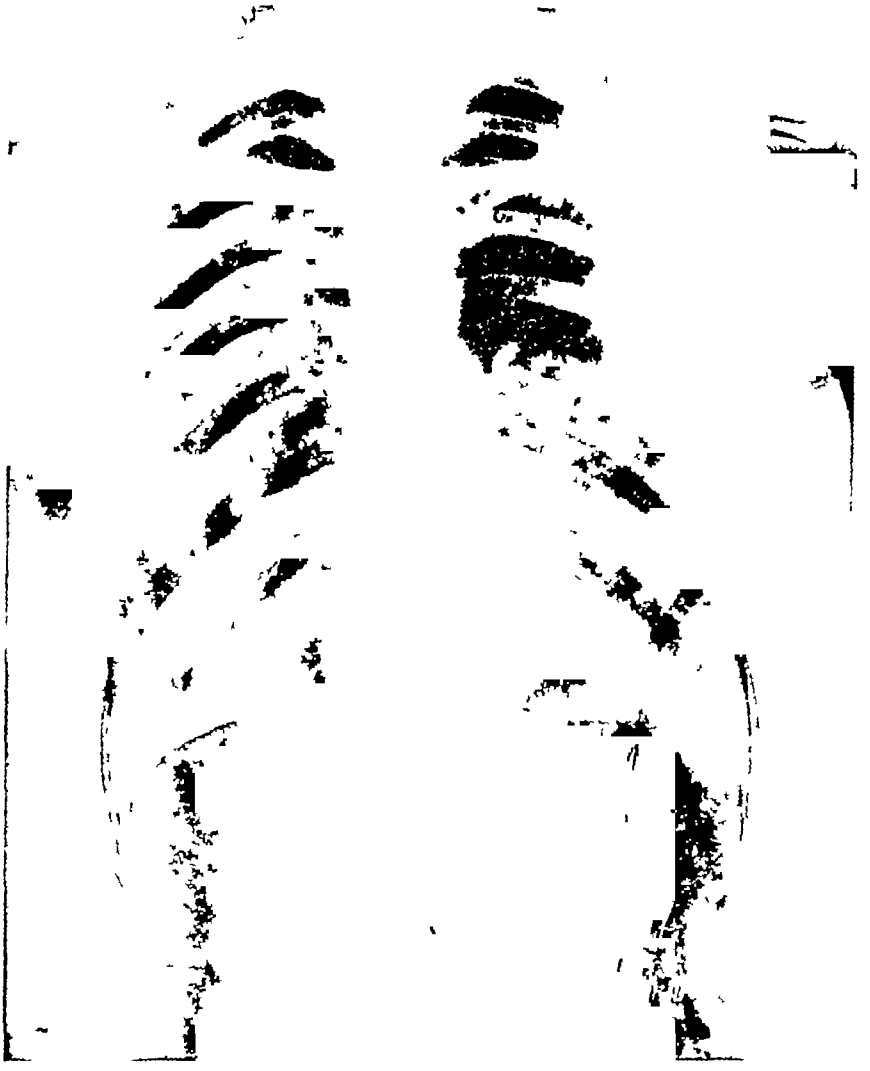


Male with high blood pressure but normal lung area. The hypertension was not of the essential type as he had enlarged spleen marked arteriosclerosis etc

FIG 3

Male with normal blood pressure lung area—normal.

Fig 4



Female—with normal blood-pressure Lung area—normal.

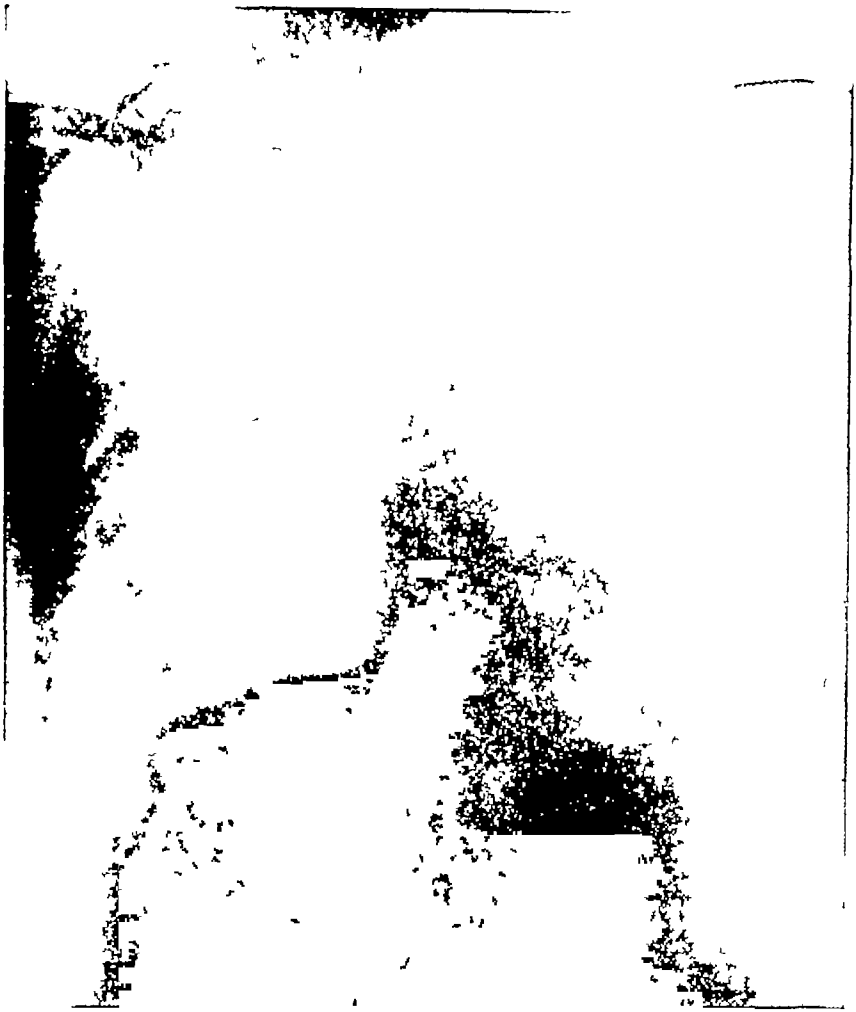
Fig 5

Male with high blood pressure Lung area—markedly diminished

Fig 6

Female—with high blood-pressure. Lung area—markedly diminished.

Fig 7



Boy of sixteen with a high blood pressure of at least four years' duration—and yet he shows no cardiac enlargement.

Progress of Medicine
During 1927*

COLLATED BY HENRY W CATTELL, A M, M D
Fellow of the College of Physicians of Philadelphia, Philadelphia

INTRODUCTORY REMARKS

As THE kaleidoscopic picture of last year's medical literature passes before the eyes of the reviewer, there is most vividly registered upon his cerebral cells an impression of evanescence and of continuous change—let us hope that it will be for the better—going on all around us 1/1917, vi-p259 It is not only possible, but even probable, that some of the most important scientific work of 1927 will pass into oblivion with but cursory present notice, perhaps many years later to be rediscovered and then advantageously utilized in the art and the practice of medicine, as has been the case in our own generation with the hippocratic use of liver in the treatment of various forms of anæmia and with the experiments performed by the Austrian monk Mendel in 1865 upon plant hybridization

The chief mode of attack of the medical problems of the day in the way of diagnosis and treatment is undoubtedly by means of biochemistry and microphysics in which higher mathematics play an important part Unfortunately, a diminishing income arises through the present economic conditions and changes in the mode of practice

* The first number above a proper name or disease, and at the end of a sentence or paragraph, is the key to the journal named in the list of medical references printed at the close of this article from which the subject-matter, thought or abstract has been taken, the next numbers, separated from the journal number by a shilling mark (/), refer consecutively to the month (Roman numeral), day of the month, year in which the journal was published, volume and page number, *but all references in which the year is not mentioned appeared during 1927* A small "v" stands for volume and "p" for page In those instances where apparent omissions of important medical subjects are noted by the reader, it will be usually found that the original papers covering such matters have already been printed in the pages of the INTERNATIONAL CLINICS during the past several years or an article upon such subject is in course of preparation for future publication Criticisms of omissions will be thankfully received, and will, when important, be taken up either by correspondence or in the Department of Medical Questionnaires

unless the physician becomes a specialist or takes a salaried position It follows in this vicious circle that the ordinary reader, through lack of money, improper equipment and lack of opportunity for post-graduate work, is now too often incapable of grasping the reasoning upon which the conclusions of an author are based, while this knowledge in the hands of sophists and quacks has done and will do much damage before the truth will emerge and prevail for the good of mankind at large

Albert P Mathews,[2/xii-23] of the University of Cincinnati, believes that one of the most serious short-comings of present-day medicine is the neglect of therapeutics, and it is in this field that physical chemistry can contribute much "The new conceptions of the end of time and mass and energy that have already upset all the foundations of mechanics and physics," giving rise to revolution of biologic thought as great as any the world has ever seen, "and the revolution will unquestionably have important consequences for the physician and his patient" Thus, bacteria may be killed by ultra-violet rays only of a specific wave-length, while the enzymes are destroyed by other frequencies, thus permitting the standardization of vaccines and serums in one and the same receptacle Potassium at the present time considered necessary for the functioning of the body is present in very small quantities and appears to be the only radio-active agent existing in the tissues and is furthermore the only element which generates cathode rays at any other time than at very rare intervals

It is the belief of biologists at the present time that the blood grouping of a child will be the same as one or both of the parents Recently the State Medical Department of Wurttemberg made this statement to the court "A child invariably inherits its blood group characteristics from one or the other parent As, in the present case, neither the mother's nor the alleged father's blood shows the characteristics found in the child, the only conclusion possible is that parentage by the accused man is excluded" The criminal court at Ellwangen, Wurttemberg, accepted this opinion as final, freed the accused man and sentenced the mother to jail Naturally, the contrary does not hold good—that if the grouping of the child's blood had been that of the suspected father, that he was necessarily the father of the child.

Like all present-day conditions, the sliding fee scale of physicians is being attacked from various standpoints and its friends and foes are gathering for a battle royal "In the February *Survey Graphic* Mr Michael M Davis has made an interesting contribution to the discussion of sickness bills Government bureaus and social service departments have attempted to bridge the gap between the costs of illness and the average man's ability to pay by including an item for the care of the health in the annual budget. As Mr Davis points out, the fallacy of this provision lies in the uneven distribution of sickness One serious disease may wreck the budget of a middle class family that could have coped with the usual series of minor troubles without difficulty

"In America the attempt to find a remedy for this situation has resulted in the adoption of a sliding fee scale by physicians and hospitals In a sense this is no innovation Medical men have had to adapt their charges to the circumstances of their patients since time immemorial The systematization of fee schedules by doctors and hospitals is distinctly a modern product though, born of the increase in specialization, the rising cost of hospitalization and the growing dissolution of close personal contacts between the physician and his patients From the medical viewpoint the sliding scale of fees is the only means whereby the doctor is able to make his services available to all classes of people It is true that as a result of it some people are paying too much and others too little On the other hand, it is the best method at our command to-day and it is doubtful if any plan can be devised, in so delicate and complex a matter, that will be absolutely fool-proof Mr Davis' article shows a sympathetic understanding of both the advantages and the disadvantages of the current system At the same time that he points out its faults, he makes it clear that it cannot be abandoned until a better way has been worked out. The expedient of the sliding scale should be treated like the old family auto that knocks and stalls on the grades The doctor who drives and the patient whom he tries to take over the hills do well not to scrap it until they can find a better one But they have a common interest in working together to get one "[3/1-28-28]

A year of the revised Medical Practice Act in New York State appears to show that while there have been only 103 arrests during the past year, 1000 illegal practitioners are estimated to have left

the state within the past year This reminds us of the fact that when the Philadelphia County Medical Society was driving out the abortionists from Philadelphia a number of years ago these left this part of the country only to kill their victims in Boston and elsewhere throughout America, and that eternal vigilance is the only price of lasting freedom from any reform effort

The number of medical schools existing in America has been constant, but their capacity has been taxed to the utmost by the great increase in the number of students in attendance To take care of this, millions and millions of dollars are being put into buildings, many of them in well-planned groups, with the best possible equipment that is obtainable The Bureau of Education, Department of the Interior, has published an article by Dr N B Colwell, in which he states

During the past two years changes made in medical schools in the United States have been chiefly in the erection of new buildings, improvement of teaching staffs, the rearrangement of subjects in the curriculum, and closer affiliations with hospitals, with increased opportunities for students personally to study diseases at the bedside in dispensaries and hospitals Several medical schools are in the throes of erecting enormous teaching plants—a continuation of the marvellous development in this respect during the past several years

The number of medical schools in the United States fluctuated from 80 in 1923 to 79 in 1924, when the General Medical College of Chicago was discontinued, and back to 80 in 1925, when the University of Rochester School of Medicine and Dentistry was added In 1926 the charter of the Kansas City College of Medicine and Surgery was revoked, but a new institution was promptly chartered to take its place under the name of the American Medical University of Kansas City

During the past two years the number of medical students has continued to increase Instead of only 12,930 in 1919, the number increased to 17,728 in 1924, to 18,200 in 1925, to 18,840 in 1926, and to 19,532 (estimate) in the session of 1926–1927

The number of graduates also increased from 2529 in 1922 to 3562 in 1924 and to 3974 in 1925, but decreased to 3962 in 1926 Although the number of medical schools has remained at about 80 since 1920, the numbers of both students and graduates have increased

At the beginning of the reorganization of medical schools in 1906 the 162 medical schools then existing enrolled 25,204 students, an average of 156, and turned out 5364 graduates, an average of 33 Last year (1926), however, the 79 medical colleges in the United States enrolled 18,840 students, an average of 238, and turned out 3962 graduates, an average of 50

It is evident, therefore, that, although the number of schools has been reduced to a more nearly normal supply for this country, the average numbers of students and graduates have been increased. During the past few years, indeed, the medical schools rated in Class A have been filled almost to capacity

The movement toward the building of larger teaching plants, including both medical schools and hospitals, continues During 1925 and 1926 such enlarged plants have been established and partially completed at the Universities of Colorado, Columbia, Illinois, Ohio, Rochester (N Y), Vanderbilt, Western Reserve, Wisconsin, and Meharry Medical College

Those which are nearing completion or are partly occupied are of the Universities of Chicago, Northwestern, Tennessee, and the Detroit Medical College Medical centres with more modern buildings erected nearer to teaching hospitals are being established by the medical schools of George Washington, Georgetown, and Howard Universities at Washington, D C, and also by Temple University at Philadelphia

During the last fifteen years no medical school has enrolled the enormous classes which were found in several schools in years prior to 1910 "Quantity first" gave way to quality, but even the quantity is being restored Although the average classes are larger, there has been an increase in the amount of laboratory space, in equipment, and in clinical facilities in dispensaries and hospitals

Since 1912 most of the medical schools have limited their enrollments to the numbers which could be given a satisfactory training in medicine, depending on their varying space, equipment, and hospital relations This limitation of enrollments has reduced the attendance in few of the colleges formerly having unduly large enrollments The capacity of all others remains the same or shows an increase

There has been, however, a tremendous onrush of students into all departments of colleges and universities, including the medical schools, so that, according to some reports, many properly qualified students who have sought admission to medical schools could not be accepted The reports have been somewhat exaggerated, because many students made applications simultaneously to as high as fifteen or twenty medical schools, and some even matriculated in from two to several medical schools in order to be sure of admission somewhere.

Only one registration could be filled by one man, and at the opening of the session numerous vacancies remained. A careful survey of the situation indicates that at present the medical schools are filled nearly to capacity, so that if the number of students desiring to study medicine continues to increase the capacity of the medical schools will need to be enlarged or other medical schools established

The United States still has more physicians in proportion to its population than any other country In 1925 there was one physician to every 753 people, while Great Britain reports (1921) one physician to every 1087, Switzerland and Japan reported (1925) one, respectively, to every 1290 and 1359, Germany (1912) one to every 1940, Austria (1912) one to every 2120, Sweden (1925) one to every 3500

In the United States, as in other countries, there has been a tendency during recent years for physicians to locate in cities rather than in rural districts There is not a shortage of physicians, as already shown, the problem being one of distribution, because the excessive supply in cities more than offsets the smaller numbers in rural communities

With the greatly improved means of communication—the telephone, interurban cars, and the automobiles—physicians from towns or cities can furnish medical care for much larger districts than formerly Such complaints as are

heard are not of a lack of medical service but of the larger charges for the physician's services because of the greater distance he has to travel

This problem is being studied by country-life associations and others interested in rural communities, with some prospect of improvement The consolidation of country schools is establishing centres where in addition to the schoolhouses, small hospitals or health centres may be placed, through which medical service can be obtained in cases of emergency

Through some of the financial foundations, small hospitals are being established in rural districts which have a population sufficient to maintain them

Dr W C Woodward, of Chicago, in the *American Medical Association Bulletin,* December, 1927, states that since January last the interest aroused in basic science legislation has been so great that it seems almost necessary to put a brake on the formulation and enactment of basic science laws A basic act has nothing to do with the art of healing, except as it is an act that will determine whether an applicant for a basic science certificate is sufficiently well grounded in the basic sciences to justify his certification to a professional board to determine whether he knows how to apply those sciences in the every day practice of a healing-art As basic science laws relate only to sciences and not to arts, the proper agency for the execution and enforcement of a basic science act is not a professional body, but rather a scientific body The function of a basic science board is merely to certify that the person whom it examines is fit for a professional examination. He can see no good reason for issuing basic science certificates to men who are already in practice Regarding enforcement of basic science acts, they are in effect self-enforcing A man cannot take a professional examination unless he has a certificate Five states at present have basic science acts In conclusion, he states that a law is a prescription given by the legislature for the relief of some ill of the body politic and must be adapted to the cure or relief of that ill, and that after it is enacted it must be effectively administered.

According to the American Medical Association the following matters of special interest to physicians will be considered at the Seventieth Congress now in session at Washington (1) Safeguards in promulgation of regulations under National Prohibition Act and Harrison Narcotic Act (2) Sale of dangerous cosmetics, etc (3) Federal income tax and reduction of travelling expenses (4) Amendment of National Prohibition Act (5) Pay of medical officers in the Army and Navy retired on account of disabilities

incurred in line of duty in the World War (6) Medical, surgical and hospital services for veterans suffering from diseases and injuries not of service origin (7) Protection of residents of the District of Columbia from incompetent healers (8) Sheppard-Towner maternity and infancy legislation (9) Prevention of use of dogs in scientific research

According to a statement by the Bureau of Labor Statistics, Department of Labor, on January 6th, labor organizations have greatly expanded their original field of activities, and not only provide various benefits for their members, but have also undertaken to improve their members' economic position through social and protective measures Among these may be mentioned provision made for the sick, establishment of labor banks, credit unions, building and loan associations, legal aid departments, etc Some unions may include social or protective measures, such as the establishment of various kinds of insurance, a definite health service or educational or recreational activities Assistance to members in time of unemployment is another function often undertaken by labor organizations

The past year has been an unusually healthy one throughout Europe and the Americas Dr Hugh T Cumming, Surgeon-General of the Public Health Service, forecasts that this gratifying condition should continue in the United States through the present year or even improve, as the people of the country are rapidly assimilating the common rules of keeping fit. While infantile paralysis was quite prevalent, and smallpox existed, there have now been weeks in which no smallpox existed and poliomyelitis appears on the decline, its epidemic stage having apparently reached its climax. One case of plague from contact with the ground squirrel in a child five years of age was reported The public health education by means of the dissemination of literature, advice from competent physicians, often as a part of the curricula of the public schools and through the newspapers, have all contributed to the better social and economic condition of the people

During the past year, the Public Health Service reports that quarantine has been so effective that there has been no entry from abroad of quarantinable diseases But, on the other hand, seventeen cases of smallpox, two cases of leprosy and a like number of human plague were apprehended and detained at quarantine stations of the Public Health Service

Pathogenic organisms are isolated one after another as definite etiologic factors in the production of certain disease entities only to be later on classified as variants of one and the same bacterium The burden of responsibility for disease is being slowly, but perceptibly, shifted from the long-abused bacteria, and receptivity of the soil more heavily incriminated just as there is a marked change in the treatment of the patient with a disease rather than of the disease itself, as was so ably illustrated by Harlow Brooks' paper on pneumonia in the last issue of INTERNATIONAL CLINICS

In recent studies on respiratory infections in German institutions, it was found that the incidence and mortality of these diseases were not dependent on fluctuating prevalence of pathogenic organisms and that strict asepsis influenced them insignificantly Definite reductions in incidence and mortality were obtained only by a regulation of nutritional disorders

Edith Lincoln,[4/v34-p418] in an attempt to ascertain the etiology of respiratory infections responsible for absences from school, found the only correlation to exist between (1) anomalies of the respiratory tract and (2) the amount of carbohydrate in the daily diet

Hadley,[5/v40-p1] in a comprehensive article on "Microbic Dissociation," states that without doubt many of the problems of medicine have their root in bacterial instability, that obscure points in bacteriology, serology, bio-chemistry and immunology will here find their explanation For the first time an understanding of these phenomena has offered a "rational and exact basis for developing virulence by individual colony rather than by mass culture, selection" The influence of dissociation on high temperature may help us to a better understanding of the hyperthermia in infectious disease A relapse in fevers may be related to incomplete dissociations The necessity for controlling the cyclostage in the individual case has been recognized as being of the utmost importance Problems pertaining to the "carrier state" may also need revision in the light of these new findings Hadley suggests that active microbic dissociation and the phenomenon of bacteriophage may constitute two stages in a single phase of normal reproductive physiology existing for adaptive purposes

Admitting the theorem that the child has a right to be well born[6]—and who will deny it?—then the child should have the same rights to grow in health and proper environment into manhood and womanhood and to die in peace and comfort But the millennium is not yet at hand, and as long as the politicians are again giving us back typhoid fever and are preventing the eradication of two millions of lepers throughout the world, there is little hope that the utopian dreams above mentioned will come true for some time to come In this connection, Oliver Wendell Holmes' remark that the training of a child should begin at least with its grandparents and the statement in the Ten Commandments that the iniquities of the fathers shall be visited unto the third and fourth generations, also mean that the problem is not quite as easy of a solution as some would seem to think

The chief of the Children's Bureau of the Department of Labor, Miss Grace Abbott, in the course of a study of delinquent children and their parents in Boston, says that the evidence points to a decrease in alcoholism since the prohibition law went into effect, but that it was 7 per cent. higher in 1924–1925 (23 per cent.) than in the lowest year 1921–1922 (16 per cent) One million five hundred thousand gallons of liquor were withdrawn in 1927 against over 2,000,000 of the previous year, according to the Commissioner of Prohibition, so that there is now a seven- or eight-year supply instead of the accepted five-year stock The Government will therefore not press its plan with regard to legislation for the manufacture of medicinal whiskey

Hrdlička,[7] of Washington, has published an interesting, illustrated account of eleven children who, before learning to walk upright, have spontaneously developed the habit of running effectively on all fours with the hands fully open or partially closed This is a highly interesting phenomenon of non-pathologic nature like the babe in the first few weeks of life who will grasp a stick so tightly with its hands that the entire body may be raised off of the bed when the stick is lifted, without relaxing its hold

BLOOD PRESSURE

The Silent Gap in Auscultatory Estimation of Blood-pressure — In 1918, L Tixier[8/v28-p502] discovered in examining the blood-pressure of certain patients by the auscultatory method that there

was a zone of silence extending over a distance of 20 to 30 mm of mercurial pressure, which was preceded and followed by a zone of clear arterial sounds At first, this was thought to be a rare phenomenon associated with aortic stenosis, but later on it was found that in people suffering from hypertension, the phenomenon was by no means uncommon J Barbier (*La Méthode Auscultatoire,* 1921, p 89) considers this gap to be the acoustic equivalent of the anacrotic pulse. The method of determining this gap is described by Paul C Gibson in the *Lancet,* November 12, 1927

BUBONIC PLAGUE

A fatal case of bubonic plague, the first to occur in the United States during the past year and one-half, occurred in Clayton, Calif, on July 8th, according to a report received by the Public Health Service The case was that of a child, five years of age, and is directly attributable to the handling of ground squirrels which the family in which the death occurred had been trapping for food Since this occurrence more than 5000 ground squirrels in the county have been killed, but all have been found negative of the bubonic plague. The diagnosis of the case of bubonic plague was confirmed by the inoculation of a guinea-pig with a culture from the patient, with the result that the animal acquired the disease The campaign against plague infection has been waged for the past twenty-seven years, and in the past fifteen years one case of plague each year has been reported from California

CANCER

J H. Mueller [9/v45-p243] has undertaken an experimental study of Gye's cancer theory In a fairly large series of experiments extending over a period of twelve months he has found no indication whatever of the necessity of two factors in the production of Rous sarcoma. They were unable to duplicate the results of Gye or the partial confirmation of his work by Murphy and Flu They found that uncontrollable local and individual variations may produce apparently satisfactory experiments in occasional chicks, but viewed as a whole they mean nothing These authors feel that more evidence is needed in support of Gye's theory if it is to be given serious consideration

Among other theories of the etiology of cancer that are finding new devotees is that of Lancereaux and Thomas, who believe that cancer is determined primarily by insufficiency of trophic nerve innervation which Stajano [10/v and vi] asserts sets free energy of cellular growth on the one hand and causes simultaneous cell degeneration

McDonald [11/v125-p705] thinks that cancer is due to "cell-reproduction favored by a certain optimum (for reproduction) increase of the univalent elements (such as sodium and potassium) over the bivalent elements (such as calcium and magnesium) and that this specific alkalinity and ionic association (for reproduction) produces such increase of permeability of the cell membrane and increase of conductivity as will favor cell division It is also suggested that radiation aids in the treatment of cancer by promoting an increased hydrogen-ion concentration of the blood-serum and by stimulating the ionization of the bivalent substances (particularly calcium) "

Martland [12/v88-911] and his co-workers have demonstrated that lead in the form of a stable metallic colloid does not combine with the phosphatides of the cancer-cell when injected intravenously, but the colloidal particles are deposited in the spleen, liver and bones, gradually break up into ionic forms and re-enter the circulation This conversion occurs in the spleen and the ionic lead is eliminated through the bile for later reabsorption by the gastro-intestinal tract Therefore these colloids are of no therapeutic value Injection of ionic forms of lead does not have an arresting effect on tumors Soluble ionic salts have little or no effect on tumor growth Other forms of lead differ very widely as to toxicity and stability and frequently lead to thrombosis This therapy is therefore extremely dangerous and indicated in only a few selected cases The indiscriminate use of lead preparations by persons having no understanding of their varying toxic effects will only serve to discredit the good results obtained by Bell.

Ochsner [13/iii] recommends the knife in all operable cases and believes that irradiation is of no real value and only lowers the general resistance He has had best results in inoperable cases with colloidal gold given by mouth, local application or in inaccessible cases by intravenous injection. Gold inhibits the growth of the cancer and improves general nutrition.

The possible advantage of malarial treatment of cancer is put forward by several writers Konsuloff [15/v-16] states that cancer-cells are particularly sensitive to heat Theilhaber [15/v-16] urges the biologic treatment of cancer, stipulating that thymus extract has been found to destroy cancer-cells *in vitro* Most of the hormones show some anti-cancerous property He suggests blood-transfusion, injection of foreign proteins and lipoids or actual implantation of organs and also malarial inoculation

Todd [14/v1-p175] reports favorable results from a treatment with lead selenium colloid which he attempted in the belief that the selenium might diminish the toxic action of the lead

Goldstein [15/v] believes he can demonstrate a connection between cancer and drinking-water He found that the drinking-water from a district in Prussia, where the relative incidence of cancer is abnormally low, caused urinary irritation in cancer subjects, whereas it was well tolerated by healthy persons Rats inoculated with cancer given such water showed a partial arrest of the disease as compared with controls

A possible advantage in the combination of colloidal lead therapy and radiation has been suggested by F C Wood [12/v80-p1216] and also by H J Ullmann,[12/v80-p1218] who suggests that the lead stored in the bones after the first course of treatment may be mobilized, so that the tumor may be releaded without further injection of the metal

DIABETES See also INSULIN

Breaking-up of Insulin—Funk [16/v53-p21] reports that insulin may be split up into three substances *A*, *B*, and *C* The *A* substance has been found equal in efficiency to the whole product It may be used in cardiac patients who cannot tolerate insulin itself, as it causes *no shock* Desgrez-Rathery and Froment [17/v177-p148] assert that in some cases it may be demonstrated that there is no resumption of pancreatic function after the use of insulin treatment and therefore no cure

Treatment—Treatment with insulin depends on early administration in full doses, it being necessary to ascertain and administer the optimal dose in each individual case Years of treatment are necessary with a close surveillance of apparently cured cases in view of the rapidity of onset of grave symptoms should they recur

Harrop [18/v40-p216] emphasizes the fact that unconsciousness from overdosage of insulin is not always preceded by the usually described prodromal symptoms Administration of carbohydrate in these cases does not always have a prompt effect Evidently the degree of hypoglycæmia does not determine the severity of the reaction nor does administration of sugar always relieve it The toxic effects may be due to some other action of insulin

Hausler [19/v123-p56] suggests that diabetes is not due to deficiency of insulin but to the presence of an antagonistic substance, glycæmin, which inhibits uptake of dextrose from the plasma by the blood-corpuscles Glycæmin causes glycogenolysis

Synthalin has the advantage that it may be administered orally, but owing to its delayed action is of no benefit in coma Lorensen [20/v89-p322] dismisses synthalin with the verdict that it is not needed in mild cases and in the severe cases insulin gives better results Adler [21/v6-p493] has found that administration of synthalin may lead to an increase of urobilinogen and to jaundice Morawitz [22/v74-p571] and Calvert [14/v2-p649] both assert that synthalin has an injurious effect upon the liver In experiments described in a preliminary report of the Medical Research Council [14/v2-p517] it was demonstrated that in normal animals synthalin has to be administered in doses producing definite toxic action on the liver in order to produce a decided fall in blood-sugar Other experiments, however, show that synthalin accelerates metabolism of glucose already present in the circulation

The gastro-intestinal disturbances due to synthalin may be prevented by simultaneous administration of bile-salts Adler uses 5 gm. of decholin with every dose of synthalin Rabinowitch reports good results with synthalin and states that untoward symptoms may be avoided by interposing a two-day rest interval between the two-day synthalin treatments Calvert obtained good results in only 50 per cent. of his cases

The synthalin for oral administration is supplied in 10-mg and 25-mg tablets by Kahlbaum, Berlin, and distributed also by the London agency, Schering The initial dose is two small tablets gradually increased to one large tablet

Another valuable accessory in the treatment of diabetes is "myrtillin" Myrtillin is found in all green plants, but especially

in the leaves of blue-berry and myrtle It is also found in yeasts, bacteria and oatmeal Allen [12/v80-p1577] has demonstrated that myrtillin will reduce or completely suppress hyperglycæmia after large quantities of dextrose, as well as the hyperglycæmia due to epinephrin. Striking and uniform improvement was obtained by administration of myrtillin in diabetic dogs The drug is harmless, can be administered orally and prevents rather than causes hypoglycæmia Its action is feeble and uncertain as compared to insulin and it is useless in acidosis or infections It is not offered as a substitute for insulin Myrtillin (known as myrtomel) is recommended as a means of gradually raising tolerance and reducing insulin.

DISTEMPER

Serum and Vaccination—According to a recent communication made in the Academy of Sciences by Doctor Roux, Director of the Pasteur Institute, it is believed dogs may in future be safeguarded from distemper by vaccination A serum on which this hope is based has been discovered by Dr Charles Lebailly, director of the far-famed Calvados Bacteriological Laboratory Nineteen dogs have already been vaccinated, and although all were subsequently exposed to infection, none contracted distemper

DRUGS, NEW

Ephedrin is gaining in popularity in the treatment of asthma, hay-fever and nasal disorders In asthma and hay-fever it must be looked upon as palliative and not curative Ockerblad and Dillon [12/v88-p1135] have found it of use in combating the depressive effect of spinal anæsthesia. Ephedrin stimulates the sympathetic nervous system in the same way as epinephrin, but it also stimulates the central nervous system and the heart (the latter only when given in toxic doses) Ephedrin, 0 1 gm , is given subcutaneously before the blood-pressure has fallen below 100 mm. mercury When given by mouth there is no untoward effect, but action is delayed Merkel [23/v37-p22] uses ephedrin as a spray, topical application and cotton pack in rhinology He finds it a safe drug in nasal disorders It has a quicker and more sustained action than epinephrin and there is no secondary relaxation It produces ventilation and drainage of the nose and sinuses According to Taylor, [20/v23-p289] ephedrin hydro-

chloride relaxes the bronchial musculature, raises blood-pressure and overcomes congestion of the nasal mucosæ It is of value in coryza and sinusitis Ross [25/v5-p509] has found that it decreases the toxic action of cocaine and does not act synergistically

Sodium Barbital—Leshure [12/v88-p168] reports that 6 to 12 grams of sodium barbital by mouth one-half hour before cocaine anæsthesia will prevent toxic symptoms and the drug is also an effective antidote in cases where toxic symptoms have already developed Kreitmar [22/v74-p190] has succeeded in producing a synthetic ephedrin (ephetonine)

Ceanothus—G C Taylor [26/v99-p214] discusses the properties of the *Ceanothus americanus* in a recent issue of the *American Journal of Pharmacy* This plant contains a mixture of alkaloids in its root bark An extract of which administered orally hastens blood coagulation due to increase of thromboplastin The effect is rapid and lasts for one to two hours There are no untoward effects

Avertin—Unger and Heuss [21/v6-p968] describe a new anæsthetic, "avertin" or "E 107," for rectal administration It is an organic bromine compound, a tribromethyl alcohol or ethyl alcohol, in which three atoms of hydrogen have been replaced by bromine Polano [22/v74-p630] reports his experiences with this new anæsthetic in 200 gynæcological operations, using the following technic Five-tenths gm of medinal is given the night before operation, 0 1 gm of avertin per kilogram of body-weight is dissolved in 200 c c of distilled water and injected high into the rectum A cotton-wool tampon covered with boric ointment is inserted into the anus The drug may be used alone or in combination with scopolamine, omnopen, spinal or inhalation anæsthesia In the last only half as much as the ordinary amount will be necessary The after-effects are slight. There is no vomiting Complete relaxation is obtained, which means that this anæsthetic is contra-indicated in labor Butzengeiger [16/v53-p712] has used avertin in two hundred cases and recommends it for nervous patients, children and for use in private houses The narcosis lasts from two to four hours Its chief advantage is simplicity of administration and absence of after-effects

Gentian Violet—In gentian violet we have a new specific for thrush Clark [5/v40-p423] concludes that this dye completely inhibits the growth of the mycelial yeast forms of endomyces albicans in dilu-

tions up to 1 100,000 and inhibits their growth to some extent in dilutions up to 1 400,000 Mercurochrome does not have this effect

ERYSIPELAS

Birkhaug [12/v88-p885] has supplemented his work on erysipelas by actively immunizing twenty-four patients with definite histories of frequent recurrent attacks of erysipelas by means of a toxic filtrate of *Streptococcus erysipelatis* Five hundred, five thousand, and fifty thousand skin test doses of extracellular and intracellular toxin are injected intramuscularly bi-weekly Musser [12/v88-p1125] reports favorable results in eleven cases of erysipelas from Birkhaug's anti-streptococcic serum

Intestinal Toxæmia—B W Williams [14/v1-p907] has demonstrated a great multiplication of *B welchii* in the small intestines in cases of acute obstruction and late peritonitis In cases of acute obstruction there was evidence of the actual presence of exotoxin of this bacillus in the small intestines *B welchii* contains a hemolysin which is lethal when injected into mice By use of an antitoxic serum the author was able to reduce the mortality in the peritonitis of acute appendicitis He recommends the use of *B welchii* antitoxic serum in acute intestinal obstruction before operation to minimize the danger of toxæmia, which causes death after many successful operations Forty c c should be injected intravenously before operation and 40 c c intramuscularly after operation

B welchii antitoxin should also be given in all cases of peritonitis that show signs of intestinal paralysis and toxæmia The antitoxin neutralizes the *B welchii* toxin that has been absorbed by the intestine

Power and Sherwin [18/v39-p60] conclude that two classes of decomposition products are formed from protein in the lower intestines, due to bacterial action, namely, the non-nitrogenous and nitrogenous or amino derivatives The amino compounds are more toxic than the non-nitrogenous compounds The detoxication by splitting off of the nitrogenous bodies is accomplished principally by the liver, but the kidney and gastro-intestinal wall may also play a part They conclude that the human body possesses a non-specific chemical defense mechanism for detoxication of small amounts of putrefactive

material in the intestine, produced by action of putrefactive organisms on unabsorbed protein

GENERAL PARALYSIS See SYPHILIS

GOITRE

Experimental Production of Goitre—McCarrison [14/v1-p916] announces the experimental production of a new type of goitre, unrelated in its origin to iodine The author desired to ascertain whether a predominantly white flour diet, excluding green vegetables and fruit, would produce goitre in animals receiving sufficient iodine and living under strictly hygienic conditions

The type of goitre developing in these animals has to be distinguished from chronic hypertrophic or adenoparenchymatous goitre and diffuse colloid goitre, both of the endemic type It was caused by a diet containing more than 60 per cent of white flour or vitamin-poor carbohydrate, 20 per cent or less of protein with fats and inorganic salts (including iodine) and excluding green vegetables and fruits Intense secretory hypertrophy causes exhaustion of epithelia with replacement by non-secretory elements and fibrous tissue, often without much increase in size of the gland

The author believes this type of goitre occurs occasionally among people whose main diet consists of white flour, who will be predisposed to Graves' disease, which may develop after fright, worry, pregnancy, lactation or infectious disease

Subjects of the retrogressive stage may exhibit symptoms of myxœdema. Iodine would be of no avail in prophylaxis of this type of goitre, but a diet rich in vitamins might prevent its development

McClendon [27/v7-p189] in his study of iodine with reference to goitre states that as long as heavy doses of iodine are given to patients for a number of days before exophthalmic goitre operations, and small doses after goitre operations, it is inconsistent for physicians to declare such doses harmful A dose producing a skin rash is much higher than that needed for prophylaxis of goitre

An interesting investigation was conducted by Oliver,[28/v1-6-p10] revealing the fact that chlorinated drinking-water by displacing iodine may cause goitre.

Strouse and Binswanger[12/v88-p161] report beneficial results obtained

by iodine therapy in a syndrome closely resembling hyperthyroidism without changes in the basal metabolic rate They believe that the condition is due to iodine deficiency They also suggest a diphasic function of the thyroid, one associated with the nervous system and the other with basal metabolism So many varying reports as to the use of iodine and its dosage in thyroid disease have appeared during the last years that it is a relief to have the indications crystallized for us by an authority like Marine.[29/v6-p127] According to this author iodine deficiency may be considered in three groups as follows (1) Deficiency of iodine due to reduced amount of iodine in water and food (2) Intestinal bacteria or parasites diverting an otherwise normal intake (3) Factors causing a temporary deficiency such as diet, pregnancy, puberty, infections, Graves' disease, etc

The greatest use for iodine in goitre lies in prophylaxis In treatment its use is limited or conditioned Desiccated thyroid combined with iodine is indicated in simple goitre Functional insufficiency may be relieved by this means, but its effect on the deformity may be modified by the duration of the latter and the presence of complications In Graves' disease the benefits derived from iodine administration are limited and the dangers of its use considerable Real or relative insufficiency of thyroid function may be relieved Iodine should be given in all cases in doses not exceeding 1 mgm for at least two months The control of large doses is practically impossible and Marine therefore does not recommend them He believes the mechanism of the temporary benefit from large doses of iodine in Graves' disease is due to "the rapid accumulation of colloid in the alveolar spaces producing a pressure retention of the secretion until cells accommodate themselves to function under increased tension"

INSULIN See DIABETES

Insulin in Non-diabetic Diseases and Thyroxin—Insulin as a remedy in non-diabetic diseases is proving a valuable aid Picard prescribes 5 units hypodermically in all septic inflammations except osteomyelitis

Darnet [30/v1-p319] recommends its use in all skin lesions in which hyperglycæmia may be demonstrated and has obtained good results in eczema, furunculosis, psoriasis, leg ulcers, acne, etc

Aldersberg and Perutz recommend the external application of

insulin in leg ulcers Twenty or thirty drops are applied to the ulcer, which is then covered with vaseline In eight of ten patients excellent results were obtained

Richter [31/v68-p10] believes insulin a most valuable remedy in non-diabetic diseases, especially in diseases of the liver In these cases insulin causes a recovery of the injured cellular function Among the conditions responding to such treatment may be mentioned catarrhal jaundice, cirrhosis with jaundice, cancer, syphilis and post-anæsthetic hepatitis

Thyroxin has been found by Burge and Williams [32/v81-p307] to have an antagonistic action on the influence of insulin on sugar metabolism, which may explain the lowered respiratory quotient and glycosuria in exophthalmic goitre

Thyroxin is the second hormone to be prepared artificially, adrenalin being the first Kendall made an attempt to analyze the constitution of thyroxin but his findings have not been accepted by Kendall and others

Harington and Barger [33/v21-p169] discovered its true composition and have produced a synthetic thyroxin, thus greatly reducing the cost of this product.

By Kendall's method only 33 gm of thyroxin could be obtained from three tons of fresh glands, or a yield of 0 001 per cent. Harington's process yields 0 12 per cent

INTESTINES

Parasites—A great deal of attention is being centred on the intestinal parasites Craig emphasizes the frequency of occurrence of symptoms of infection with *Endamœba histolytica* in seemingly healthy subjects These symptoms are largely confined to the digestive and nervous systems and consist of diarrhœa, constipation, anorexia, evanescent neuralgic pains in the right iliac region and over the descending colon, dull aching in lower abdomen, flatulence and tenderness in the region of the liver Headache, neuralgic pains, sleeplessness, irritative pulse and excessive perspiration of the hands and feet are frequently noted

Craig [12/v88-p19] urges the importance of routine microscopic examination of the fæces in such persons to reduce the number of carriers James [12/v89-p1469] emphasizes the fact that survey examinations are for

the most part made on old stools not checked by permanent preparations There is a definite increase in positive observations in permanent preparations over those in unstained material, fresh or old By use of fresh material and study of permanent preparations from it, he believes that the percentage of positive observations in amœbiasis can be raised on the first examination from 33 per cent. to 75 per cent, raising the chance for diagnosis from 1 in 3 to 3 in 4 He describes a method of obtaining suitable stool material and a method for preparing permanent slides and for their transportation In the discussion following this paper, K M Lynch suggests one of the reasons for the seeming increase in prevalence of intestinal amœbiasis in this country is the mistaking of harmless amœbæ for *E histolytica* The intestinal amœbæ cannot always be differentiated in the active form A fixed specimen is essential to a correct diagnosis

Willner submits a critical review of the remedies which have recently been introduced in the treatment of amœbiasis which he summarizes as follows

Yatren is preferred by the Germans, who consider it superior to emetine In France and North America stovarsol and treparsol are the treatments of choice usually combined with emetine In England emetine is most popular, but smaller doses are used than formerly Yatren being a proprietary remedy offers no control of its purity Stovarsol and treparsol are more often followed by relapse than yatren. Toxic, even fatal, results may be produced by even small doses of stovarsol The toxicity of treparsol is not so great.

Auremetine has been used in only forty cases, but in thirty-seven of these the results were satisfactory as far as eradication of amœbæ is concerned The combined treatment with auremetine, bismuth and stovarsol gave best results Yatren still seems the most valuable remedy, as it is least toxic

LUPUS ERYTHEMATOSUS

Schamberg and Wright[34/v15-p119] announce a new successful treatment of lupus erythematosus with gold and sodium thiosulphate In the twenty-five cases treated eruption disappeared in five, almost disappeared in six, and in twelve cases a marked improvement was recorded Only one case showed no improvement One patient died Future investigations will determine best dosage, frequency of admin-

istration and advisable duration of treatment Mollgaard's preparation of gold and sodium thiosulphate was given intravenously, beginning with small doses to test the patient's tolerance and gradually increasing The initial dose is 50 mg dissolved in 2 c c of sterile distilled water If this is well tolerated a second injection of 100 mg is given from five to seven days later Doses are then given at weekly intervals In cases of the diffuse type the initial dose should not exceed 25 mg, gradually increasing to 50 or perhaps 100 mg In one patient it was believed that a fatal acute attack was stimulated Gold in such cases acts similarly to tuberculin in active tuberculosis After disappearance of lesions a one-month rest interval should be observed, after which a few injections are given to prevent relapse which may otherwise occur

MALARIA See also SYPHILIS, GENERAL PARALYSIS OF THE INSANE

PARALYSIS, GENERAL See also SYPHILIS, GENERAL PARALYSIS OF THE INSANE

PARATHYROID

According to McCann,[12/v88-p566] at present the only definite indications for the use of parathyroid extract are in tetania parathyreopriva, infantile tetany and low blood-calcium The blood-calcium index must be carefully watched, as higher than 12 mg per 100 c c is undesirable and above 15 mg per 100 c c. is dangerous

Gordon and Cantarow [12/v88-p1301] have obtained good results from the use of parathyroid extract in checking hemorrhage Ten to fifteen units are given every thirty to thirty-six hours and continued until the hemorrhage ceases (one to three doses usually suffice) After hemorrhage ceases one dose is given after thirty-six hours In 304 out of 347 patients hemorrhage was checked

Cantarow [18/v40-p120] and his co-workers found that parathyroid extract acts as a mobilizer of calcium In jaundice it restores the normal distribution and functional availability of this element Twelve hours after administration the variation in whole blood-calcium of jaundiced and non-jaundiced patients was practically identical The extract also seems to check the tendency of jaundiced tissue to bleed, this action being attributed largely to increased coagulation of the blood and reduction of capillary permeability due

to an increase in functioning calcium The tendency to prolonged slow hemorrhage may also be diminished The extract is of value as a pre-operative measure in jaundice to prevent hemorrhage by producing a normal coagulation time Overdosage is warned against as also the use of the preparation in blood dyscrasia In gastric irritation it gives better results than calcium administration

Parathyroid extract has been administered in cases of delayed union of fractures on the ground that the increase in blood-calcium obtained will aid in the healing of the fracture Lehman and Cole [12/v89-p587] explain that the parathyroid extract mobilizes the calcium stored in the bones, thus increasing the blood-calcium and prove by their experiments that parathyroid extract does not hasten calcification, but if anything retards it

Hueper [35/v3-p1002] reports improvement in calcification and production of osteoid tissue but necroses in the myocardium and in the cortex of the suprarenal gland after repeated administration of parathyroid extract, emphasizing the need of caution in its use According to Stewart and Percival,[33/v21-p301] the hormone controls the distribution of calcium between the blood and the tissues by regulating the proportion of total serum calcium which is readily diffusible

Recently Hunter and Aub [36/v20-p123] discovered the efficacy of parathyroid extract as a mobilizer of lead stored in the bones They found a striking parallelism between the storage and excretion of lead and calcium. A definite excretion of lead is produced by the first treatment, but none thereafter

Lisser, Smith and Shepardson [12/v88-p461] have been successful in their efforts to cure maternal tetany with Collip's parathyroid extract Cases of excessive menstrual bleeding also responded to this treatment In the case of maternal tetany the first dose was fifty units injected intravenously at 8 30 A.M Twenty-five units were given intramuscularly at 1 P M , repeated at 7 P M and 1 30 A M After that the patient was given ten units subcutaneously every six hours day and night for two days when the blood-serum calcium had reached normal Subjective symptoms are first affected In from 48 to 72 hours the blood-calcium returns to normal

In his experiments on dogs Hueper [35/v3-p14] found indications at autopsy that, given in physiologic doses, parathyroid extract induces (1) a prolongation of the systole and shortening of the diastole,

(2) dilatation of the vessels of the internal organs, (3) intensification of the tonus of the stomach and intestine and, (4) a rise in blood-calcium He concludes that overdoses of parathyroid extract produce metastatic calcifications in various organs Hemorrhages, thromboses and necroses in the organs are caused by the action of the extract on the heart and circulation The kidney function may be fatally impaired by calcium precipitation

RHEUMATISM

In the puzzling field of rheumatism we have further contributions by Small [37/v173-p101] and others of reported isolation of a serologically specific non-hemolytic streptococcus with distinctive biological characters from blood and throat cultures of patients suffering from rheumatic fever and from the fæces of chronic arthritis patients, mentioned in last year's "Progress of Medicine" [1/v1-p214] This organism produces acute arthritis when inoculated in rabbits and a proliferative osteoarthritis resembling chronic arthritis Small has treated a number of patients with vaccines of this organism and beneficial effects were noted in several cases of subacute cardio-arthritis and chronic arthritis In some no results were reported as developing from this treatment. Pain, tenderness, swelling, and stiffness of the joints were alleviated in patients with rheumatic fever by treatment with an antitoxic serum prepared from the newly isolated streptococcus cardio-arthritidis which Small believes to be the cause of rheumatism. Llewellyn, in the *Journal of State Medicine,* volume 35, p 89, thinks that the nervous instability of rheumatic children is due to deficiencies or fluctuations in thyroid secretion, as thyroid disorders are frequently seen in rheumatic disease In regions where goitre is endemic, both incidence and mortality rate from acute rheumatism and rheumatic heart disease are unusually high Certain skin abnormalities in rheumatic patients suggested that this nervous instability might be associated with or dependent upon thyroid disorder Children with goitre or enlarged thyroids seem especially predisposed to rheumatism Llewellyn stresses the fact that it is not simple enlargement of the gland that seems to cause such a predisposition, but rather a thyroid instability expressed either as deficient or excessive secretion of the gland

In chronic arthritis good results are being reported from treat-

ment with o-iodoxybenzoic acid In 31 cases Trauba[12/v89-p124] obtained marked improvement in 16 per cent, moderate improvement in 16 per cent, slight improvement in 32 per cent, and no improvement in 29 per cent He used at first intravenous injection of 1 gram of ammonium salt of o-iodoxybenzoic acid dissolved in 100 c c of boiling water The initial dose was 50 to 75 c c—gradually increased to 100 c c The injections were given at bi-weekly intervals, eight usually sufficing The constitutional reaction from the intravenous administration of this drug was so severe, however, that the author prefers to give the drug in capsules by mouth, 0 5 gm of the drug being used in form of capsules covered with phenyl salicylate One capsule is given the first day and two a day for thirteen days After a rest period of two weeks this treatment may be repeated

In 43 cases Young[38/v26-p346] reports marked improvement in 56 per cent, moderate improvement in 23 per cent, slight improvement in 14 per cent., and no improvement in 7 per cent Acute cases respond better than old chronic cases Smith[39/v196-p305] believes this new remedy to be more effective than salicylates It is an analgesic and relieves muscle-spasm and reduces œdema Joint function is increased and muscle massage is possible at an earlier stage in subacute joints

Gunn[14/v1-p125] obtained definite improvement in eight out of ten cases of rheumatic carditis in children by intravenous administration of gentian violet Five c c. of an 0 25 per cent solution in sterile water were injected Caution should be used in dosage and selection of cases One fatality

SYPHILIS

Malarial Treatment of General Paralysis—The Nobel prize for 1927 has been awarded to Julius Wagner von Jauregg, in recognition of being one of those who has contributed most towards the progress of the world and the welfare of humanity It is estimated that with malarial treatment of general paralysis as instituted by Wagner von Jauregg, one-third of general paralysis patients may obtain complete remission and one-fourth be relieved of their most distressing symptoms It would be difficult to calculate how much money will be saved for the state by dismissal of $33^1/_3$ per cent of institutional cases, not to mention the relief of family and relatives of the

afflicted, and, last but not least, the improvement in the condition of those still requiring institutional care

According to Bayly, [11/v120-p200] 40 per cent. may be expected to return to work and 30 per cent show decided improvement. In those in whom treatment does not result in an improvement sufficiently marked to permit their discharge, great relief from gastric crises and lightning pains is noted, control of the sphincters is regained and optic atrophy checked

The number of remissions is increased, and, in cases of relapse, a repeated malarial treatment is often of decided benefit The mortality associated with inoculation malaria is 5 per cent

Ferraro and Fong [40/v65-p225] state that the results of treatment depend upon the clinical type of the paralysis, on the effect of the treatment on body-weight and on the duration of symptoms prior to treatment. Good results were obtained in 78 per cent of the manic type, 71 per cent of the depressed type and 63 36 per cent. of the expansive paranoid type The demented, juvenile and schizoid types proved resistant Very little improvement from the malarial treatment was reported in these

In a recent article Wagner von Jauregg [41/v77-p753] emphasizes the fact that inoculation malaria is much more sensitive to quinine than real malaria. A few grams of quinine are sufficient to completely and permanently cure inoculation malaria In 1000 cases in which 5 grams of quinine were given for one week after therapeutic malaria, there was not a single relapse He also states that although the necessity of transmission from patient to patient is a disadvantage, the latter is greatly diminished by the fact that malarial parasites retain their infective power for some time after removal When an equal quantity of ½ per cent. sodium citrate solution is added to the blood withdrawn for inoculation purposes, the parasites retain their infectivity for 24 hours even at low temperatures and Wagner von Jauregg adds that two of his co-workers have perfected methods by which this power may be retained for 72 hours In this way vast territories may be supplied with gamete-free malarial parasites from paralytic patients in a few large centres

Kunde, Hall and Gerty [12/v80-p1304] believe that similar results, with less danger to the patient, may be obtained by non-specific protein therapy Jennings [11/v125-p799] also subscribes to this opinion, enumer-

ating as disadvantages of malarial therapy the necessity for transmission from patient to patient, the impossibility of growing the organism in a laboratory, the marked anæmia and jaundice often developing as complications and the mortality rate which he estimates as ranging from 6 to 20 per cent. He submits a clinical study of 18 cases treated with intravenous injection of typhoid bacilli

Mackenzie [14/v2-p223] believes the advantages of this treatment lie in the fact that the material can be standardized and regulated and injections may be discontinued at will Moreover there is no incubation period, no failure to react and coincidentally an immunity against typhoid is established The T A B vaccine recommended is expensive however and the possibility of inaccessible veins or thrombosis also has to be reckoned with

PERNICIOUS ANÆMIA

Liver Diet—The liver diet in pernicious anæmia recommended by Minot and Murphy,[12/v88-p211 v89-p759] referred to in last year's "Progress of Medicine," achieves prompt remission in nearly all cases The morphologic appearance of the red cell becomes normal, as do also cell volume, volume index and stroma index Lack of response to treatment is due to complications or to an insufficient amount of liver in the diet Symptomatic improvement is marked The appetite improves and the tongue becomes normal in appearance Neural symptoms are also improved There is a prompt temporary increase of reticulocytes and a rapid rise of red corpuscles

In 18 of 105 patients achlorhydria persisted. Huston [37/v174-p520] obtained definite remissions in 29 out of 30 cases There was evidence of bone-marrow regeneration Relapses may occur if the diet is discontinued and renal disease presents a distinct contraindication to this form of treatment.

Simmonds [12/v88-p1047] and his co-workers believe that the good results obtained from liver diet are due to the combination of iron and vitamin E found in liver, and that the function of vitamin E is in some way associated with iron assimilation. The livers of beef, pig and chicken and also the kidneys of pig and beef have been found to be hemoglobin formers Fish liver does not have this property Minot and Murphy believe that liver stimulates the maturation of megaloblasts and have found that a few grains of the non-protein fraction of

liver seem to be just as beneficial to these patients as whole liver This fact, with the recent results obtained in reducing high blood-pressure by means of a liver extract, suggests a possible endocrine function of the organ

Hot Baths—Because of the marked improvement following hot baths in rabbit syphilis Schamberg and Hsien Wu Tseng [12/v88-p1217] undertook an investigation of the effects of this treatment in human syphilis They found it was possible to raise the temperature as high as 106° F quite safely by hot baths Skin lesions disappeared altogether in some cases after treatment, in others showed marked improvement. A slight improvement in the WaR was observed, although quantitative alterations were not certain No definite conclusions are drawn as the authors realize the necessity for observation of numerous cases for an extended period They are not of the opinion that hot baths alone can cure syphilis, but they do feel that this treatment may prove a valuable adjunct.

Their observations as to the effect of hot baths in general may be summarized as follows (*a*) Transient leukocytosis followed by a brief reduction in white cells, (*b*) slight rise in systolic blood-pressure, frequently a drop in diastolic blood-pressure, both temporary, (*c*) a 10 per cent fall in blood-cholesterol, (*d*) a 10 per cent. rise in blood-sugar In a comparison of the Kahn precipitation test, the Meinicke precipitation test, the Kolmer-Wassermann test and the Ruediger-Wassermann test, E H. Ruediger [42/v11-p450] reports the following results Two hundred and sixty-five consecutive specimens were tested Of these 165 gave negative results by all four methods and 100 gave positive results by one or more methods Among the negative results by all four methods were several patients who had been treated for syphilis and two specimens from patients with primary syphilis Fifty-nine gave positive results with all four methods In 41 cases the results did not agree. The Ruediger-Wassermann test gave positive results in all of the 100 specimens The Kahn precipitation test missed 28 per cent, the Meinicke precipitation test missed 32 per cent., and the Kolmer-Wassermann test missed 30 per cent. of the positives

The Kahn test gave positive results nine times where the Kolmer gave negative results and seven times where the Meinicke test gave negative results

THE LIVER TREATMENT FOR PERNICIOUS ANÆMIA

Hurst remarks that there is little "pernicious" about anæmia except our ignorance of it, and that it would be preferable to describe it as addisonian or hemolytic anæmia Piney is of the opinion that though the disease must probably be classed among the deficiency diseases, a constitutional predisposition is an essential factor and that intravascular islets of megaloblast tissue are found in the hepatic capillaries, arranged as in the embryo Pernicious anæmia can occur only in persons who have remnants of megaloblastic tissue in the liver, which in the normal person has undergone atrophy Piney believes the condition has been engrafted on a congenital malformation. There may be a relation of subacute degeneration of the spinal cord and vitamin B deficiency to account for this type of deficiency disease The coagulation is retarded, and the globules from a sediment rapidly became fluid like plasma, and the coagulation takes on the plasmatic type The number of red cells is always much decreased to lower than 1,500,000, and as patients near death the number is as low as 500,000 to 450,000 Hayem saw them decreased to 292,000 Hemoglobin is diminished to from 25 to 12 per cent. of normal index. The amount of coloring matter is generally normal or increased The inequality in size of blood-cells is striking, and the forms vary In staining they take on color easily, a feature which is seen in the juvenile type of blood-cells The central portion is more highly stained The nuclei in the red cells are seen in pernicious anæmia with 2 to 5 in each 100 white blood-corpuscles Reduction in number and change in form are the salient features A leukopenia involving the bones with 2500 white cells per cubic millimetre may be reduced to 800, polynuclears to 55 per cent., and lymphocytes 45 per cent.

Patients who are fed liver derive from it qualitative and quantitative improvement which produces a normal blood-picture generally within from eight to fourteen weeks Minot and Murphy used this diet for pernicious anæmia, pellagra, sprue and beriberi Patients with pernicious anæmia may have taken faulty diet for years In some instances, therefore, treatment must be continued for several years Good results have been reported, among others from Collis P Huntington Memorial Hospital, Harvard University, Medical Clinic of Peter Bent Brigham Hospital, Clifton Springs, N Y In some

instances the results were startling The good results obtained in pernicious anæmia indicate a deficiency disease, a faulty blood construction rather than increased blood destruction Experiments on dogs showed that all fractions of liver of beef, pig, sheep, calf, and chicken contained a substance capable of regeneration of hemoglobin and red cells Whole liver feeding, however, is the most effective The pallor and weakness in dyspnœa rapidly disappear, the blood becomes denser, and the refractometric index is increased The impression had been gained of late years that pernicious anæmia had become more frequent, such reports were made in Denmark, Holland, Austria, and Switzerland, and a questionnaire made regarding this impression elicited 80 answers with reports of 2820 cases, and the indication that an increase had occurred between 1915 and 1924 Forty-eight answers supported this opinion.

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THE MORBIDITY AND MORTALITY FROM DIPHTHERIA

A note of disappointment sounds through the discouraging reports of the increase of morbidity and mortality from diphtheria which comes from several countries The profession had believed diphtheria conquered after toxin antitoxin had been used quite generally In London between 1904 and 1924 the morbidity from diphtheria per 1000 persons living rose from 11 2 to 19 1 In 1924–1925 with better diagnosis, better education and public health measures, an increase has occurred for unknown reasons At pres-

ent the *Corynebacterium diphtheriæ* is recognized as the pathological agent of diphtheria This knowledge was used to make the toxin, and patients are sent to the hospitals much earlier than formerly J Schwalbe is of the opinion that the severe cases are due to unfavorable sanitary surroundings It has, however, been pointed out that not the poor housing conditions with lack of light and space were to blame, for the better portion of Berlin has also shown an increase in number and severity of cases It has recently become necessary to immunize nurses while in their student years by higher doses and stronger preparations than have been used so far, and beyond the ideal toxicity recommended by the Hygienic Laboratory A great number of them showed reaction to the Schick test after being inoculated a few months before Nine cases of diphtheria had occurred within eighteen months in the Illinois Training School for Nurses.

The main office of the Board of Health at Berlin had intended to introduce general vaccination for diphtheria An inquiry was made among German specialists and prominent clinicians to check up on the opinions held by these men regarding protective vaccination for diphtheria Some of the authors believe that a compulsory vaccination was not called for as cases had not been numerous Others believe that under certain circumstances it might be advisable, but the general tendency was against making vaccination compulsory American statistics show marked increase in numbers between the second year and the age of school children, which is not the same in other countries Where the pre-school age is involved, it would not suffice to use Schick test and bioscopy in school children only The danger from convalescents is considerable, for they retain the infection for long periods People coming in contact with cases of diphtheria may harbor *Corynebacterium diphtheriæ,* as much as 15 per cent, though not all are virulent Healthy carriers, as a rule, lose the bacilli within about ten days "Carriers" seldom suffer from diphtheria as they have antitoxin in their blood. There are others who incubate the disease, and harbor diphtheria bacilli in their throats, and have no antitoxin in their blood Carriers are Schick-negative Susceptible Schick-positive patients should be immunized and unsusceptible virulent carriers segregated and treated until negative Schick tests and bacteriological examinations of nose and

throat swabbings should both be made in all places where children and young people congregate

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AMOUNT OF BLOOD IS INDICATED FOR TRANSFUSION

Blood-transfusion was an heroic operation not so long ago, and a certain romantic sensation of sacrifice is attached to the performance Not always are the willing donors the right subjects for transference of their blood to the patient If the blood is not compatible with that of the patient, lumping (agglutination) occurs This is shown when the two bloods are mixed in the test-tube Grouping of blood has been of great interest in court procedures and racial differences have been sought. Though many advances have been made, the grouping is not entirely on a firm basis as yet There are four main groups, one of them is zero, and any person belonging to this group may be considered a universal donor, whose blood is generally tolerated by most people Grouping should be made wherever transfusion is intended, and blood tests are indispensable In larger clinics, where many blood-transfusions are made, donors of various groups are generally available It will save time if the possibilities are well known when emergencies arise Blood-transfusion has been used more and more in acute hemorrhage, splenic and addisonian anæmia, in typhoid convalescence, and in many other diseases

The dosage has often been random and the methods complex Harold W Jones has succeeded in working out a standard dose and gives various other doses and technics His standard dose derived from experience on 2000 cases of transfusion is 400 c c for the average adult of 150 weight, and 5 feet 8 inches height Most cases of secondary anæmia require no more than two to four transfusions In hemorrhage the loss of blood is hard to gauge, as tissue fluid enters the blood-vessels, and continues to do so after the hemorrhage has

stopped and until the blood volume is normal or increased Keith found the blood volume 50 to 60 per cent. of normal in soldiers with hemorrhage and shock. Serious symptoms arise only after the blood volume becomes less than 75 per cent Enough blood must be given to relieve coma, stupor, rapid respiration and rapid pulse If the hemoglobin is from 70 to 80 per cent after acute hemorrhage 500 c c may be used, if it is 60 to 70 per cent use 600 c c , if it is from 45 to 60 per cent use 700, if from 30 to 45 per cent use 800 c c, providing hemoglobin was normal before hemorrhage occurred Both weight and height of the patient must be taken into consideration in determining the dose An infant 20 inches in length, and weighing 8 pounds is given a transfusion according to formula

$$1\ 8 \times - 80 \text{ c c} \qquad \times - 44 \text{ c.c}$$

The best known methods are the Unger, the citrate, and the Lindemann methods Contra-indications for blood-transfusion are cardiac decompensation, severe respiratory embarrassment not ascribable to blood loss, or suspected thrombophlebitis If urticaria results from administration of incorrect blood type, subcutaneous adrenalin injection may be given Blood-transfusion will often save life and shorten convalescence, or improve the general condition of the patient, may lengthen life temporarily, and furnish natural immune bodies, where the blood-stream is infected

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DATA ON THE PREVENTION OF SCARLET FEVER

The hopes that isolation of scarlet fever patients in hospitals would succeed in eliminating the disease have not been realized, and cross-infections have occurred even in the hospitals, with complica-

tions and mortality The last London figures available for 1922 were 12 77 per cent for those who had contracted other diseases in the course of scarlet fever, as complications, and 48 deaths occurred among 15,279 Fatal cases of scarlet fever have been rare in the last twenty years The type has changed, and the disease, as compared with measles, has been considered mild In England measles were given precedence for admission, where selection had to be made

As the pathologic agent of scarlet fever has been found by Deicher in 100 per cent. of scarlet fever convalescents, its prevention should be possible The hemolytic streptococcus is quite generally accepted as this pathologic agent If only those patients should be considered infectious who have expectorated streptococci, the infectiousness could be easily demonstrated, and preventive measures adopted Deicher believes that *Streptococcus hemolyticus* changes to *Streptococcus viridans* during convalescence, that is into an avirulent so-called "pseudo-scarlet streptococcus" Vas has found hemolytic streptococci in the air of scarlet fever hospital wards One of the newer diagnostic methods which is easily executed is the plate method, which formerly was used by Meyer in whooping cough, and is used for demonstrating the Bordet-Gengou bacillus, is used for scarlet fever demonstration. Smears from the tonsils should be examined, and sputum cultures from 24 to 48 hours show the pathologic agent in 60 per cent of the first and second week of the disease

The Dicks have identified a series of organisms of hemolytic streptococcus type, which are considered the causes of the specific disease known as scarlet fever It has, however, not been proven that the organism is transmissible from one person to another The germ may account for the symptoms, but the infectiousness may be due to some other organism Hemolytic streptococci have been isolated from the throats of patients suffering from scarlet fever A culture grown on bouillon has produced a toxin which will cause local reaction in susceptible persons After recovery the patient does not respond to this test These cultures have been used to produce an antitoxin in the horse Large doses modify acute scarlet fever and a small intradermal dose blanches the rash after ten to fifteen hours It is specific It should be given early, it seems that later toxins are not so readily neutralized *S scarlatinæ* stays in the

crypts of the tonsils for ten days It has been found up to 246 days Protection from inoculation lasts for about two weeks This immunization suffices for school contact, but not for the closer family contact. In England a toxin antitoxin is in the market containing from 2500 to 10,000 skin test doses of toxin per c c It is said to produce immunity for five years In America a number of scarlet fever antitoxins have been produced, but the introduction has been slow It is a remarkable fact that in 1917, when people in German cities were starved, few cases of scarlet fever were reported In a city like Bochum there were 69 cases as compared with 500 or 600 for the annual average From 1916 to 1923 there was a steady decrease, and mortality amounted to 1 5 per cent to 3 6 per cent. as compared with 3 3 per cent. to 11 1 per cent, which was found from 1910 to 1920 Scarlet fever had not been considered serious, but since 1925 mortality had increased from 1 5 per cent to 3 5 in 1927

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CARBOLIC ACID IN STREPTOCOCCAL INFECTION

T Stacey Wilson has used injections of 20 to 25 grains of carbolic acid every two hours for adults or adolescents of sixteen years or more, and 8 to 10 grains in children of eight to ten years of age, using the sodium sulphocarbolate He has tried it in various types of streptococcal infection, for obstinate chorea, threatening involvement of the mastoid in acute otitis media, endocarditis following scarlet fever, rheumatic swelling of joints, and pericarditis, with a temperature of 103° F, and pneumonia following double mastoid operation after measles with rapid good success The remedy is given until symptoms of carbolic acid poisoning set in, that is complete muscular relaxation, general malaise, and debility, with drop of temperature below normal

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CUMULATIVE INDEX

(THIRTY-EIGHTH SERIES—1928)

(The Roman figure, i, refers to Volume I (March), and the Arabic figures, to the page in which the reference will be found.)